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EXCHANGES,

The following space is to be given to exchanges. Notices not exceeding three lines, will be free to subscribers as long as our limit of space will allow.

and orders likewise. I say "most" because some would not intergrade; for contrary to the old adage, nature *does* sometimes jump. The theory of descent, and the connection of distinct, recent species by their extinct ancestors being admitted, we may next inquire what convenient artificial limits may be erected to define the "species;" for all scientific investigation would be at a stand still if we have no names whereby to designate the various organisms about us. Probably the only definition of any use is that a species is any assemblage of similar individuals of presumably common ancestry, which cannot be connected by living intermediate specimens with other groups of individuals. It is the break in the chain which allows us to constitute the species; and whether this break be wide or narrow is of little importance so long as no recent organisms intermediate in characters are known.² However this idea may be worded, there is no possible foundation for species on any other basis. Now, many species, especially those having a wide range of distribution, show in some parts of their range considerable modifications usually correlated with peculiarities of climate, soil, or other factors known or unknown of their environment. These modifications are often sufficient for specific separation were it not for the fact that in some localities the links connecting the extreme forms occur. We have here species in process of making, waiting only for the extinction of the intermediate individuals or for the further intensification of the differential characters, to become full-fledged specific types. It is obvious that science must take cognizance of these incipient species, if it is to be a true record of nature; and for this reason "subspecies" or "varieties" are recognized. Of course they "run into" each other in some part of their range, otherwise they would be *species*. To ignore these varietal forms would be not removing obstructions from "the high-way of the Omnipotent" as Mr. Wetherby says, but a piece of the most pedantic falsity. The far-reaching importance of these local or geographic "subspecies" will be recognized when we understand that in them we have the material of future species in the making. We have moved away from the Darwinian conception that species have arisen from favorable variations of occasional individuals, preserved by the action of natural selection or "survival of the fittest"; and now we see much reason to believe that the whole mass of individuals over a given area of changed or changing conditions, is simultaneously remoulded, not

²The question of hybrids need not be considered here for obvious reasons.

by *individual variations* (which must usually be quickly effaced by interbreeding with normal or differently modified individuals), but by the steady action on the entire mass of the factors of climate, elevation, food-plants, currents and other quantities of the complex equation unknown to us.³

Mr. Wetherby proposes to avoid the use of subspecific or varietal names by the circuitous method of writing the *locality* after the specific name. He would say "*H. tridentata* Say, var. Campbell Co., Tenn." "*H. tridentata* var. Cincinnati, O." "*H. cereolus* var. Sanford, Fla." etc. Now the disadvantage of this system is that it tells absolutely nothing to the man who has no specimens from those exact localities, without a detailed description of the shells in each case. Moreover, Mr. Wetherby would write "*H. appressa* var. Woodville, Ala." for both *H. appressa perigrapta* and *H. sargentiana*, two very dissimilar forms. Who would know which one he meant to indicate? The trinomial system on the other hand offers a convenient, concise, readily understood index to geographic and local races. When one says "*P. cereolus septemvolva*" the idea is conveyed as exactly and much more concisely than by saying "*P. cereolus* large var. St. Augustine," for unless one has specimens from this locality he would not then know just what was meant. Again, were one to say "*P. cereolus* small var. Sanford, Fla." nobody could tell whether the variety found there was that with an internal lamina (*P. cereolus carpenteriana*) or without a lamina (*P. cereolus volvoxis*). Now what is the use in all this circumlocution when we have so convenient a system of nomenclature as the trinomial system, already in practical use in other departments of zoology.

Having discussed the abstract questions at issue at such length, we can devote but little space to the particular cases cited by Mr. Wetherby; but this is the less needful because what we wish to establish is the great importance of subspecies in general, not of any particular one of our own naming. We may, however, re-affirm the

³ One of the most potent causes of specific or varietal differentiation has been the glacial epoch, which undoubtedly caused a southward movement of the entire northern fauna. Upon the recession of the ice sheet the species thus driven south found themselves exposed to changing climate and food-plants in their new home. Those following the retreat of the ice found the topography, soil and drainage systems of their former area in the north vastly changed. What wonder that we find many geographic subspecies! And shall we shut our eyes to the results upon our snails of the action of these cosmic forces, these manifestations of the Omnipotent?

reality of the distinction between the mass of southern, and the northern specimens of *P. appressa*. The northern shells described by Say have no incised spirals whatever, and the upper lip-tooth is frequently developed. The southern specimens (which we have called *P. appressa perigrapta*), have spiral incised lines more or less developed, and the upper tooth is wanting in the vast majority of cases. When it is present, as in the Cherokee Co., N. C. examples mentioned by Mr. Wetherby, I would regard it as an interesting case of reversion.

As to *Polygyra tridentata*, Mr. Wetherby has not read my paper with sufficient care to see my meaning. He attacks my *P. fraudulenta*, but says in the next sentence that *P. fallax* is perfectly distinct from *tridentata*. The truth is that *Helix fallax* of Wetherby and other modern authors and collectors is identical with my *fraudulenta*! The true *H. fallax* of Say is identical with *H. introferens* Bland, as I have already stated in this journal and elsewhere. So my critic discredits and affirms the validity of this form in one article! As to *P. tridentata edentilabris*, Mr. Wetherby has evidently never seen it. The var. *juxtidentens* is a well-known form. I believe it to be a distinct line of differentiation, well worth attention and recognition by name.

I have not referred in this article to the large class of individual variations such as is shown in the banding of many *Helices*. This mode of variation is often repeated, different species having parallel modifications. The mutations are frequently not inherited, any of the forms giving birth to numerous others, as is the case with the band-varieties of *Helix nemoralis*. This tendency to "sport" in all directions is a totally different thing from the moulding of an entire race explained above; and its products cannot usefully be given varietal names. They are best expressed by formulæ devised to cover entire classes of such variations.

TYPES OF ANODONTA DEJECTA REDISCOVERED.

BY CHAS. T. SIMPSON.

In making a final arrangement of the general collection of *Unionidæ* of the National Museum I found the other day among some

Unios, Lewis' types of *Anodonta dejecta*. The species was furnished by Dr. H. C. Yarrow, Surgeon and Naturalist of the Wheeler Expedition, and was said to have come from the Arkansas or its tributaries, west of the 100th meridian. The lot consists of three broken valves, two of them forming a normal pair but very much distorted.

I saw in a moment that the shell I named *Anodonta mearnsiana* in the NAUTILUS, Vol. VI, no. 12, p. 134 was the same, and my name will therefore have to be relegated to the synonymy.

Lewis described his species in Field and Forest, Vol. 1, nos. 3 and 4, page 26, and in Wheeler's Report upon Geographical and Geological Explorations and Surveys West of the One Hundredth Meridian, vol. V, Zoology, p. 952, 1875, but did not figure it.

I am almost certain that the locality given by Dr. Yarrow is wrong, as the specimens collected by Dr. Mearns were from San Bernardino Ranch, Arizona, out of waters that drain into the Colorado River of the West. A very large number of specimens were sent, and there can be no doubt as to where they were found.

It would indeed be a strange thing if this species was obtained from two places seven or eight hundred miles apart, in two distinct drainage areas. As the locality given for Lewis' species is rather vague, and a large amount of the collections of the Wheeler Expedition were made on the Pacific slope it is quite probable that the types of *A. dejecta* came from the Colorado drainage basin.

Washington, D. C., Aug. 1st, 1894.

DESCRIPTIVE NOTICES OF NEW CHITONS, V.

BY H. A. PILSBRY.

Ischnochiton pychius n. sp.

Shell small, oval, moderately elevated, with fine and distinct though rather obtuse dorsal keel and slightly convex side-slopes; bright *flesh-pink*, with a few white dots along the sutures, and creamy angular patches on the outer portions of the pleura of some valves, the girdle dull flesh-colored with indistinct whitish mottling in some places.

Median valves short, the posterior outlines slightly concave, with the beaks but slightly indicated. Lateral areas slightly raised, each

divided by one curved radial groove in front of the middle of the area, with one or several shorter, less distinct grooves in front of it; *concentrically sculptured with coarse, low, irregular wrinkles*, which make the sutural margin feebly dented. Central areas finely and minutely sculptured with *irregularly zigzag transverse, vermiculate subgranose wrinkles*, which are broken into granules on the ridge, and are punctulate, the outer portions of the pleura more coarsely wrinkled. Valve i having weak radial grooves and concentric wrinkles. Valve viii with central, low, mucro, the posterior slope somewhat concave; sculptured like the head-valve but more obsoletely.

Interior rose-pink, fading to white on the sutural laminæ. Sinus wide, notched at the bases of the sutural laminæ; eaves narrow and *distinctly porous*. Median valves with 1-1, tail valve 16 slits; teeth sharp, *very distinctly crenulated at the inner edge*.

Girdle wide, densely clothed with scales which are weakly striated, and measure about one-seventh of a millim. in width, and *imbricate inward and backward*.

Length 11, breadth 8 mm.

Hab. St. Vincent Gulf (Bednall).

A peculiar little species, shorter than most Australian *Ischnochitons*, and wrinkled much as in *I. striolatus* Gray. In the individual before me there are creamy patches at the outer ends of valves iv, v, vii and viii; on the last valve there is some olive-green variegation of the cream color.

Chiton (canaliculatus var. ?) *tricostralis*, n.

Allied to *C. canaliculatus* Q. & G. (+*insculptus* Ad. and *stangeri* Rv.) and *C. discolor* Souv. (+*miniaceus* Cpr.), but having fewer radial riblets on end valves and lateral areas than the first, and more elevated than *discolor*, with projecting, more backward-hooked mucro on the tail valve.

Shell oblong, elevated, acutely keeled with nearly straight side slopes. Color variable, either (1) uniform chrome yellow, or (2) olivaceous mottled finely with white, with some white patches on the lateral areas, the outer halves of the pleura blackish, girdle olivaceous with cream-white bars opposite the sutures.

Median valves a trifle beaked, the posterior (sutural) margins nearly straight. Lateral areas well raised, having three radial tuberculate riblets, the middle one shortest; tubercles rounded and spaced on front two ribs, closer and compressed on the posterior rib,

where they denticulate the sutures. Rarely a fourth very short rib is indicated on some valves. Central areas having a smooth dorsal band of about the same width in front and behind, or somewhat wider in front. Pleura having 14-15 longitudinal riblets, narrower than their intervals, the inner 1 to 3 on each side not reaching to the anterior margin of the valve. Head valve with 17-19 radiating tuberculate ribs. Posterior valve elevated, the mucro projecting, posterior slope concave. Interior milky bluish, the sutural laminæ white.

Girdle densely clothed with imbricating finely striated scales, shaped like those of *Chiton sinclairi* and measuring about one-third of a millim. in width.

Length 17, breadth 9 mill.; an olivaceous, variegated specimen is somewhat larger.

Hab. St. Vincent Gulf, S. Australia (W. T. Bednall).

This form differs from *C. muricatus* in the shape of the girdle scales. It is more roughly sculptured than *C. canaliculatus*, with the girdle-scales different in form, although they are about the same width; and with a different pattern of coloring, although in this respect all the allied forms of the *canaliculatus* group vary a good deal. The smooth dorsal band is wider than in *canaliculatus*.

It is somewhat doubtful whether this should be considered a geographic variety of the New Zealand species or an independent species. It is at all events closely allied to the *C. canaliculatus*, although actual connecting links between the two are unknown to me. The detail figures given in volume xiv of the Manual of Conchology (pl. 36, f. 4, 6) excellently represent the sculpture of *C. canaliculatus*, being drawn from a specimen furnished by Professor Hutton.

Chiton æreus var. *calliozona* n. var.

Shell oblong, elevated, the dorsal ridge acutely keeled, side-slopes straight; light olive-green, with a few concentric lighter streaks upon each valve, and obscure dusky-green longitudinal streaks on each side of valves ii and vi, less conspicuous on iii and v. Posterior (sutural) margin of valves i to vii articulated or tessellated, being painted with alternate white and brown oblique spots. Girdle buff, paler on the outer half of its width, variegated with *transverse bars of crimson and black scales* mingled with the buff ones; about 10 bars on each side.

Median valves scarcely beaked, the posterior outline of each concave. Lateral areas raised, sculptured with two or three radial grooves, becoming more numerous toward the bases, and inconspicuous growth-striae. Central areas having a wide smooth triangle in the middle; *sculptured in front of each diagonal slope with narrow, spaced impressed longitudinal grooves*, not half as wide as the intervals, and which form a sculptured band, increasing but little in width outwards. *Toward the beaks of each valve these grooves disappear entirely, but are replaced by distinctly painted green lines*, very curiously simulating the grooves. Anterior valve with about 28 convex radial riblets, some split at base. Posterior valve with subcentral subprominent mucro, and slightly concave posterior slope, weakly radiated. Interior pale blue, the sutural laminae white. Sinus very narrow.

Girdle densely clothed with very convex, shining, polished solid scales, those in the middle of its breadth largest, measuring, six-tenths mill. in width.

Length 38, breadth 18 mill. (exclusive of girdle).

Hab. St. Vincent Gulf (W. T. Bednall).

I have not much doubt that this shell is a form of Reeve's *æreus*, but the coloration is different, the number of riblets on the pleura is not nearly so great. Mr. E. A. Smith has united *æreus* to the Mediterranean *C. siculus* (= *olivaceus*), but I can hardly endorse such a lumping of forms from totally different areas.

ISAIAH GREGOR.

We have heard with deep regret of the death of Mr. Isaiah Gregor, which occurred on the 26th of July at his home, Cuyahoga Falls, Ohio.

Mr. Gregor was not only an extensive dealer in shells, but also an ardent and earnest Conchological student. Though for many years engaged in a business requiring strict attention and skilful management, he never allowed this to interfere with the promptings of his generous heart; a fact which was constantly exemplified by his timely suggestions and gifts of specimens to friends and others engaged in Conchological pursuits. He also took much interest in the completion of the American Association's collection. His last

gift to this,—some two months ago, was a number of Florida species; among them a suite of *Strombus alatus* Gmel., remarkable for their very large size and brilliant coloring; the latter ranging from the brightest crimson to the deepest purple. The presentation of this suite gave him a great deal of pleasure, and we shall never forget his gratified expression when he saw them safely placed.

How little did he then think that his eyes rested upon them for the last time!

“We mourn him dead, yet is he living.”

[COMMUNICATED.]

NOTES AND NEWS.

TRACHYDERMON RAYMONDI IN BRITISH COLUMBIA.—Mr. C. F. Newcombe has found this species abundant at Victoria, on exposed headlands, its stations being similar to those of the *Nuttallinas*. It was formerly confused by collectors of that district with *Tr. dentiens*, young *Mopalia lignosa*, and young *Nuttallina scabra*. The occurrence of the latter species in British Columbia is extremely doubtful. *Trachydermon raymondi* will probably prove to have the distribution of *Nuttallina californica*, *Ischnochiton mertensii* and *Tonnicella lineata*.

NOTE ON ORTHALICUS MELANOCEILUS FLORIDENSIS.—In the reference to Land and F. W. Shells, N. A. (foot of p. 38) “fig. 371” should be omitted. That figure represents a shell from the Sierra Madra, and shows the conspicuous dark oblique stripe in the aperture characteristic of typical *melanocheilus*, and the spirals are very faint there. A good figure of the Florida shell has been given by Mr. Binney in “Fourth Supplement T. M. V,” pl. 2, f. 4.

AGRIOLIMAX CAMPESTRIS IN NEW MEXICO.—Mr. A. Boyle has given me a specimen of *Agriolimax campestris* which he found in his garden at Santa Fé, about 7100 ft. above sea level. The specimen is pale brown, with a pale grey unicolorous sole. So far as I know, this is the first slug recorded from New Mexico.—*T. D. A. Cockerell*. July, 1894.

NEW METHOD OF PREVENTING CRACKING OF ANODONS.—
EDS. NAUTILUS: All collectors are aware of the trouble we have

in preserving Anodons. No matter how good they may be, they won't stay so if they can only get to split up in pieces. Last spring a fish pond here was drained and I obtained a good lot of very fine large *Anodonta fluviatilis*. I washed them clean on Saturday and put them aside to dry, and when I came back Monday morning they were having a regular "pic-nic" splitting and popping. So I just gave them a bath of thin white shellac and alcohol and they have been behaving well ever since. I send you some specimens that you may see the effect it has on them.

Frank Burns, Washington, D. C.

[The specimens are still in good condition, and the plan is worth a further trial. The principle is that the shellac forms an impervious layer over the epidermis, preventing that evaporation of water from the latter which causes it to contract and break the thin calcareous layer. The shellac should therefore be applied as soon as the surface of the mussel is dry. Its main disadvantage is in the artificial gloss which it gives the shell, which would prevent its use on lusterless specimens. If the shellac is very thin it does not effect the appearance of glossy shells like *A. fluviatilis*.—Ed.]

ERRATA.—A typographical error occurred in the July number of the NAUTILUS and I desire to correct same. In the article "My Daily Walk" on page 34, the *second line under the list of species collected*, I notice the *ninth word* should have read as "county" and not "country."—Williard M. Wood.

NOTICES OF PUBLICATIONS RECEIVED.

NATURAL HISTORY NOTES FROM NORTH CAROLINA (Papers nos. 2 and 3) by A. G. Wetherby (from the Jour. Cincinnati Soc. Nat. Hist.). In these papers on "The Land Shells of Roan Mountain and Vicinity" the author enumerates fifty-four species with interesting notes on each. A parasitic species of Diptera is here recorded infesting *Zonites elliotti* and *Polygyra fustigans*.—C. W. J.

GEOGRAPHIC AND HYPOMETRIC DISTRIBUTION OF NORTH AMERICAN VIVIPARIDÆ by Prof. R. Ellsworth Call (from the American Jour. of Science for August). This interesting article is accompanied by a map showing the distribution of each species. The

author recognizes two species of *Tulotoma* (*magnifica* and *coosaensis*), four of *Vivipara* (*contectoides*, *intertexta*, *subpurpurea*, *troostiana*), two *Lioplaces*, and nine species of *Campeloma*. The main facts of the distribution and station of each species are stated, largely from the authors own wide experience in the field. It would be unreasonable to expect any discussion of synonymy in a paper of the scope of this one, but even if Prof. Call could prove the specific identity of *Vivipara contectoides* with *georgiana*, *wareana*, etc., why should he use the *latest* instead of the *earliest* name for the species? —J. & P.

Dr. WM. H. DALL has recently issued a "MONOGRAPH OF THE GENUS GNATHODON, GRAY (RANGIA DESM.)." In this essay the priority of the name *Gnathodon* for the group is demonstrated; the anatomy of both soft and hard parts is described, and the species are discussed and figured. Dall concludes that *Gnathodon* does not constitute a distinct family near *Cyrenidae*, as Fischer has it, but that it belongs without doubt to *Macluridae* and is probably an off-shoot from the *Mulinia* stock. The range of the genus is "Subtropical America, the Gulfs of California and Mexico, in shoal quiet water, varying from salt to fresh, but preferably somewhat brackish; range in time from the newer Miocene to recent seas." Three sections are adopted, *Gnathodon* typical, *Miorangia* Dall and *Rangianella* Conr. *G. cuneatus* Gray is the commonest species in collections (often under the name *Rangia cyrenoides*).

THE MOLLUSCA OF THE PARIS MAINS.—M. Locard has been making some very interesting studies of the mollusks of the water-mains of Paris, from which he has collected forty-four species belonging to thirteen genera, among which several species are described as new to science. These are, however, only slight varieties of well known species. Among other peculiarities of this strange fauna he notes four marked modifications, due to their environment, in which they differ from the types in the waters from which these mains are supplied. These are: [1] A diminution of size, due to the absence of light; [2] a decrease of marked coloration, due to the same cause; [3] decided modifications of form, generally producing a lengthened shell, due to the mechanical action of a steady and rapid current; [4] difference of general appearance, the polished, brilliant shell being developed with regularity in a constant medium. The last two peculiarities may be noticed in the shell life of those streams in tropical countries which in the shaded mountains are constant; as

differentiated from the formation and appearance of members of the same species found in the periodic streams of the open plains, which disappear with each recurrence of the dry season.

ON THE JAMAICAN SPECIES OF VERONICELLA, by Prof. T. D. A. Cockerell and R. R. Larkin. (Journ. of Malac. III, pt. 2, 1894). The material discussed in this paper consists of 18 specimens, all referred to *V. sloanii*, from Jamaica. These were dissected and their characters carefully noted. The conclusions reached are of much value to investigators of this difficult genus. "The results obtained are quite remarkable and tend to throw doubt on the validity of several characters hitherto used for the separation of species in the genus * * * The specimens show great differences from one another, so that by selecting a few of the most distinct forms, several apparently good species might be described. Yet we believe that the whole series represents the variations of but one species, *V. sloanii*, and that *V. virgata* Ckll. must be reduced to *V. sloanii* var. *virgata*. * * notwithstanding so much variability, the species as now defined should be easy of recognition. The following characters appear to be quite constant and of specific value in *V. sloanii*. (1) The under-side is always free from spots or markings of any kind, whereas *occidentalis* Gldg. from the Lesser Antilles, has some spots below. (2) The sole never projects from behind the body, as it does in one or two of the continental species. (3) The filiform glands are less than 10 mill. long, whereas in *dissimilis* and *floridanus* they are considerable longer. (4) The penis is always long, cylindrical, with the end slightly bulbous and the orifice terminal. It thus entirely differs from that of such species as *V. portoricensis*. (5) The filiform glands are always more than 10 in number thus differing from *V. morchii* and *V. dubia*. (6) The female orifice is always post median, thus differing from the continental *V. nigra*, etc."

The characters of size and shape, distance of female orifice from head and sole, size of penis and splitting of its retractor, number and length of filiform glands etc., were found to vary within wide limits, and their several variations were not correlated in the different organs, so that no dependence could be placed upon the various combinations presented for specific distinctions. Color, contrary to the opinion of some authors, seems useful in some cases. The whole series examined is systematically tabulated; and the only thing lacking in this admirable paper is *illustration*. Still, this is a lazy complaint when all is so clearly described.

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A MONTHLY

DEVOTED TO THE INTERESTS

12, 214.

OF CONCHOLOGISTS.

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Vol. VIII.

OCTOBER, 1894.

No. 6.

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THE NAUTILUS.

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THE AMERICAN SPECIES OF CARYCHIUM.

BY HENRY A. PILSBRY.

The genus *Carychium* contains some of the smallest land mollusks known. The shell is cylindrical or high conical like that of *Pupa*, but the lack of eye-stalks and the form of the lingual teeth show the genus to belong to the family *Auriculidæ*, a group best known in America by the salt-marsh inhabiting *Melampus*. The species of *Carychium*, like other *Auriculidæ*, are terrestrial in habit, living among damp leaves or wood. The genus contains about 15 recent species, distributed over nearly the whole northern hemisphere.

In THE NAUTILUS for 1891, vol. iv, p. 109, the writer gave a brief notice of the United States forms of the genus. Subsequent study resulted in a synopsis of the group, which was published in Proc. Acad. Nat. Sci., Phila., 1891, p. 318, with plate xiv. With a view of enlisting the services of conchologists in the needed examination of more material from various parts of the country, this synopsis is here reprinted. Information is needed to establish the range of the various forms, particularly in the West and South, and also the variations of the several forms. Only the collection of specimens from points geographically intermediate between the extremes of the range of this genus, and the examination of such material by a competent person, can finally decide the question of the number of naturally defined species, and which, if any of them, must be considered geographic races or sub-species.

See Ann. Mus. de Marseilles, Zool. t. II, p. 45, pl. 2, figs. 42-44, 1885.

EDITORIAL CORRESPONDENCE FROM ALABAMA.

The following paragraphs from a letter received from the junior Editor of the NAUTILUS, written from Claiborne, Alabama, under date of Oct. 18th, will be of interest to our readers:

"* * * I arrived here [Claiborne] last evening, seven days out from Selma. While waiting for a train at Selma, I took a stroll along the river. The steep bank of bluish gray clay, probably forty or fifty feet in height, tempted me to look for fossils. A small *Ostrea*, or *Gryphæa*, a *Pecten* resembling *Camptonectes burlingtonensis*, and several parts of a large *Inoceramus* told me it was cretaceous. But the specimens were too scarce and poor to warrant the expenditure of much time. From Selma I went by train to Catharine, and thence to Prairie Bluff.

"It is at the latter place that the collector of cretaceous fossils is in his element. The bluff is over one hundred feet high, and in one place slopes gradually, giving one a good opportunity to collect. Fine large specimens of *Exogyra costata* and *Gryphæa vesicularis* were abundant. The shells of the latter were unusually thick and the lower-valve very convex. Perfect specimens of *Plicatula urtica* were also common. Finely preserved casts and, in many cases, the shells of numerous species of *Gastropods*, were abundant. Exceptionally numerous were: *Anchura spirata*, *Turritella encrinoides*, *Rostellites texturatus*, *Pyropsis* sp., *Natica abyssina* and *Lunatia Halli*. Of the Cephalopods, I found *Nautilus DeKayi*, *Baculites ovatus* and *Ammonites* sp., in fair numbers.

"At Matthew's Landing, ten miles below Prairie Bluff, is the first good exposure of strata containing Eocene fossils. They are well preserved and very interesting, many that I found being new to the Philadelphia collection, *Cardita*, *Arca*, *Volutilithes*, *Pleurotoma*, being some of the principal genera. I found the spire of a large and handsome conch, reminding one of *Melongena corona*, except that the projections on the angles of the whorls are nodulose instead of spinose, but I looked in vain for a perfect specimen.

On the west bank of the river, a short distance below Clifton, are high bluffs of indurated blue clay, and I found the first (and

last, so far) *Strepomatidæ* of the trip, *Goniobasis solidula* Lea. The bank below the water-line was covered with them. In many places little springs trickled down the bank, and in these they were to be found to a height of twelve feet above the river level. Notwithstanding the very low stage of the river, I have seen no living *Unionidæ*, and only a few worn and faded valves on Burford's Bar.

"In the the bluff at Peach Tree there is a narrow stratum of ferruginous sand containing a few Eocene fossils. Monday, the 15th, was spent at Gregg's Landing, four miles below Peach Tree. As there were no accommodations there for staying over night, we made every minute tell. It is a fascinating spot; great masses of a hard fossiliferous sandstone in which *Turritella mortoni* and *Ostrea compressirostris* predominate, and which has come from an upper stratum seventy or eighty feet above the present water-line, lay strewn along the base of the cliff, reminding one of Potomac Creek, Va. In the lower fossiliferous stratum, of a dark, indurate, sandy clay, *Cardita planicosta*, *Cucullæa* sp., *Turritella humerosa*, *Turritella* sp. and *Calyptræphora trinodosa*, were the conspicuous forms.

"Bell's Landing, five miles below Gregg's, was next visited. The fossils were similar to those found at Gregg's, but among them were many rare species—rare in collections and rare at Bell's Landing.

"It was indeed singular how many uniques of some very interesting forms I found here. The stratum referred to above was also present here, but the upper one was for the most part a soft sand, and contained a greater number of species. As it was impossible to work the upper stratum in place, and as both were mixed together in the talus at the base of the cliff, I found it impracticable to keep the fossils of the two separate. I have not had time to hunt for land shells, but from appearances it seems somewhat unfavorable. On the bluffs it is extremely dry, while the lowlands are subject to overflow. To-morrow I go to work at the Claiborne fossils.

Yours sincerely,

"CHAS. W. JOHNSON."

POLYGYRA (STENOTREMA) HIRSUTA ON LONG ISLAND.

BY A. H. GARDNER, FORT HAMILTON, L. I., N. Y.

In the October number of the NAUTILUS I noted a catalogue of the land shells of Long Island, N. Y., by Mr. Henry Prime, which

seems, from my own investigations, to be very accurate. I venture, however, to supplement the same with a species hitherto unrecorded amongst the annals of the mollusk fauna of Long Island, and existing in what I believe to be a very circumscribed area. Most of the species Mr. Prime records I have found in localities other than those he names, and from his more extended investigations and those of his predecessors, Messrs. Temple Prime and Sanderson Smith—ranging over nearly the entire island—I am inclined to believe that the species of which I am about to write is to be found in but one locality, the one in which it was first discovered.

During the early spring of 1891 a colony of *Stenotrema hirsuta* was accidentally discovered by my friend, the late Mr. James Armstrong, a naturalist residing in Bay Ridge, L. I.; they were found in a small patch of woods, or rather, a small thicket, laying at right angles to a good-sized wood, at what is now 13th Ave. and 74th St., Brooklyn. The situation was a good one, being shady, and the ground covered with small fragments of boulders cast there at some past time from the surrounding fields. It had been undisturbed for years, as the position of the stones testified to; the leaves of many summers had fallen, decayed, and left their remains amongst the interstices in the form of a rich, dark mould.

The surrounding woods, for there are (or were) several in this immediate vicinity, had been thoroughly searched, both by myself and Mr. Armstrong, for many previous years, with a view of collecting specimens of the land mollusca, and had yielded to active and close search examples of *Helix* (*Mesodon*) *albolabris* and *thyroides*, *Zonites arboreas* and *indentatus*, *Helicodiscus lineatus*, *Strobila labyrinthica*, *Vertigo Bollesiana* and *milius*, but never a trace of the *Triodopsis* or *Stenotrema* groups, which, moreover, had never been noticed before by either of us in Long Island. *Stenotrema hirsuta* is at all times a rare shell in this part of the country. I know but of one specimen, collected at Highbridge, N. Y. City, and have heard of a few specimens being found on Staten Island by the late Dr. Hibbard, on the palisades of New Jersey. I have found them, but even there they are exceedingly scarce.

Now in this particular locality they abounded, and a very large quantity of specimens was procured.

The question arises how or by what means were they introduced. Evidently they were not the survivors of a species that had once flourished there, as in that case at least dead shells would have

been found elsewhere near the locality. The large quantities found would point to their having been native to the place for a long period of time. Why they had not spread is not strange when their habits are considered: they are slow in movement and retiring, loving to adhere to the under side of a stone, where moisture can be procured in the hot days of summer. Surrounded by conditions favorable to their existence, they neither seek nor require change of locality.

It is easy to account for the introduction in any place of a new plant or insect. The influence of the wind will scatter spores or seed vessels over a vast area; whilst when the locomotive powers of insects are considered, both aerial and terrestrial, it needs but a new condition, generally the scarcity of food, to cause an immediate migration, bounded only by arrival at the nearest spot indicated by instinct as the place where more suitable conditions exist, necessary to the preserval of life and development. But in the case of a snail, and especially such a slow moving one as *S. hirsuta*, it is different; to such an organism transition over an extended distance would be an impossibility, that is to say, by its own natural powers.

The only theory possible to solve this question is that they were carried there either as snails or the spawn of snails by some outside influence which we can only attribute to a winged animal capable of covering an extended distance continuously; for example, a hawk or other bird of strong flight may have left the Palisades of the Hudson river with dirt adhering to its claws containing the embryo "*hirsuta*," and winging its way across river and land, alighted on a tree at this spot, and in the process of perching, scraped off dirt and snail spawn, which dropped amongst the stones below. And again, the bird may have swallowed the *S. hirsuta*, and as it is a globular shell and of very hard substance, it may have escaped the grinding of the stones in the œsophagus, passed through the digestive organs, and been ejected at the locality with other excrement, and there perpetuated the species.

At any rate, this appears the only agency by which the species can have been introduced, and unless the same can be distinctly refuted, it forms a theory illustrated by the present example of the diffusion of certain forms of molluscan life over a continent—an agency probably uncommon and rarely put in force by the strange workings of Mother Nature.

N. B.—This locality has been recently invaded by civilization in the form of an electric road passing near it, bringing its attendant blessings (?), houses and their inhabitants. But as yet the colony exists; I collected specimens there as lately as last September.

EASTPORT NOTES.

BY REV. HENRY W. WINKLEY.

Chiton marmoreus Fab.

A variety differing from the type in size and color occurs at Eastport. The type occurs in size as long as $1\frac{1}{2}$ inches, and even a trifle more than that. The blue variety is not over an inch, the average being about $\frac{3}{4}$ of an inch. The type has the color of the interior white at the edges of the valves, deepening to rose color. In the variety, which may be called var. *cæruleus*, the rose color gives place to a delicate light blue. The outside is robin's egg blue. Though not common, this variety seems to be established. I have found it twice, and in small numbers.

Bucinum undatum Linn.

The type is abundant at Eastport. Largest specimen, $2\frac{1}{2}$ inches. (I have a specimen from near Old Orchard 4 inches long.) A variety (v. *plana*) occurs at Eastport and Grand Manan; size of largest specimen, $1\frac{1}{2}$ inches, resembling the type except in size and loss of waves. In some cases the waves remain in faint form; in some cases they are absent altogether. The type form at Eastport has the waves very heavy.

Margarita undulata Say.

Type is abundant; an albino form occurs rarely; it is about one-half the size of the type.

Terebratulina septentrionalis (young), *Menestho albula* and a few of the deep water starfishes were found at low tide in small numbers.

Astarte crebricostata—formerly common in 10 fathoms, could not be found.

The season has been a good one for collecting at Eastport. Some of the rare forms, like *Lunatia grælandica* and *Bela Pingelii*, were found at 15 fathoms, and on the whole, there was a tendency among the deep water forms to the shallower water.

THE HABITS OF FLORIDA LITTORAL MOLLUSKS.

BY JOSEPH WILLCOX.

Although the following facts may be well known to some Conchologists, there are many undoubtedly who have not had the opportunity of observing the habits of southern shells. It is a very interesting scene to witness the actions of many mollusks in the shoal waters in the bays of Florida, and on the sand flats that are exposed to the air at low tide. Below is a list of some of the shells that are found above the water level at low tide on the southwest coast of Florida:

Fulgur perversum,	Aplysia,
F. pyrum,	Sigaretus perspectivus,
Oysters,	Callista gigantea,
Oliva literata,	Nassa vibex,
Fasciolaria gigantea,	Marginella apicina,
F. tulipa,	Melongena corona,
F. distans,	Conus proteus,
Cerithium atratum,	C. Floridanus,
C. nigricans,	Cardium isocardia,
C. muscarum,	Cardium magnum,
Cerithidea scalariformis,	C. muricatum,
Lucina Floridana.	

Aplysias do not remain voluntarily out of water at low tide, as they then become dry on the surface and appear to suffer for want of water, often emitting in such cases a large amount of purple fluid. They possess no power of locomotion on land.

The *Cerithium* usually crawl about on the sand soon after the water has receded, and remain above the surface until the return of

the tide. Their tracks may often be traced more than twenty feet.

Cerithidea scalariformis habitually crawls up the stems of grass, and lives the greater portion of the time out of water.

The *Cerithium nigricans* live in large colonies between high and low water marks.

Cardium isocardia crawls out of the sand soon after the water disappears; but they do not travel far. When put in a basin of salt water, they often close their shells with a lively snap.

Fasciolaria distans is the only shell, observed by the writer, which feeds upon the *Vermetus nigricans* colonies, into the tubes of which it inserts a long proboscis.

Fasciolaria tulipa is the only shell, in the knowledge of the writer, which makes an effort for freedom when held in the hand. It projects its body out of the shell and "slashes" about its long and sharp operculum with sufficient force to occasionally bring into view some of the blood of its captors.

The *Oliva literata* often lives in colonies. It emerges from the sand soon after the disappearance of the water, and crawls for a considerable distance.

Sigaretus lives usually under the sand, but at low tide it often comes to the surface; but it does not proceed far. It is a favorite morsel for the "littoral pigs," who root it out of the sand with avidity.

Lucina jamaicensis affects the muddy sand. They lie deeply buried under the surface, and seldom are seen on top of the mud. The *Lucina tigrina* probably possesses the same habit, as many dead shells are found in places where few are seen living.

The *Pholas costata*, I presume, lives below low water mark, as their shells are washed ashore in some places in great quantities. They also live in colonies in the muddy sand flats that are dry at low tide.

The shell reposes about 10 to 12 inches below the surface, but the animal can project its long siphon to the surface, through a hole permanently kept open.

In a future article we propose giving the results of observations upon the feeding habits of some Florida mollusks.

NEW FORMS OF WESTERN HELICES.

BY HENRY A. PILSBRY.

The Pacific Slope has been proven by the researches of many collectors to be richer in varietal forms of *Helices* than any other part of the United States; but although there are a large number of well-marked local varieties, there has been a tendency to oversplit them on differences of no racial value. The following forms are believed to be sufficiently individualised to require names.

Although superficially some species such as *arrosa*, *tudiculata* etc. are very much like the European group *Arionta*, others like *Campylæa*, and still others from Lower California are like *Euparypha*, it is the writers belief that the American forms are not closely allied to these European groups, but rather to the forms found in Japan, China and the Philippines, the resemblance to European types being a case of "convergence" of one character, the shell, and not extending to the less readily modified viscera. Other allies of the Californian group are the *Hemitrochus* of Florida and the greater Antilles. In Mexico another allied group, *Lysinoe*, is found; but the genuine Californian type extends southward along the mountain axis as far as the Argentine Republic. All these American, and the East Asiatic groups are more nearly allied to each other than any of them are to the European *Helices*.

The earliest name for this group of forms is the rather cumbersome term *Epiphragmophora* of Döring; and it is proposed to use this in a generic sense, to supercede *Arionta*, *Aglaia* and *Euparypha* of American writers. The history of all these snails and their names, with a discussion of their probable ancestry and migrations, will be found in the writer's Guide to *Helices*, now in press.

Epiphragmophora ellipsostoma n. sp.

Shell globose-depressed, with low-convex spire, round periphery and almost covered umbilicus; thin; color a greenish straw tint, with one supra-peripheral brown band, surface shining, showing irregular growth wrinkles, and closely, somewhat spirally wrinkle-malleate all over, much as in the thin forms of *E. tudiculata*; the spiral tendency of the wrinkles more marked below. Whorls 4, the apical $1\frac{1}{2}$ forming a rather large nuclear shell; last whorl deeply descending in front, a little constricted behind the basal lip. Aperture very oblique, short-elliptical, obliquely truncated by the penultimate whorl; peristome rather narrowly but evenly and well reflexed

throughout, dilated at the columella insertion and almost covering the umbilicus. Alt. 12.5, greater diam. 20, lesser 16.2 mm.

Belongs to the *E. rowelli* group, but differs from other species in its malleation. From *tudiculata* and its allies, it differs widely in the elliptical mouth, coarse apex and fewer whorls. The same characters and its sculpture remove this shell from *E. traskii* and its several varieties described by Hemphill.

Locality, "San Juan del Norte" (Gabb). Probably on the east coast of Lower California.

NOTES AND NEWS.

VARIATIONS OF PLEUROCERA ALVEARE Conrad.—In L. and F.-W. Shells, part 4, (*Strepomatidæ*), page 50, Mr. Tryon says: "The species is very variable in length," leading one to infer that the other features were more constant. Such is not the case.

Specimens from Cypress and Shoal creeks, Ala., present such a difference that on first sight the mature shells of one stream would not be taken for the same species as those from the other.

From Cypress creek they have the folds or tubercles on each whorl and the striæ on the base well defined. From Shoal creek they are eroded on the spire, giving the shell a cylindrical appearance; body whorl smooth and the striæ of the base faint or wanting; a number from both streams are two-banded; the upper band causes the dark spots Mr. Lea mentions in his description of *pernodosa*. In both streams they were found on rocks in the current.—A. A. Hinkley, *Dubois, Ill.*

NEW LOCALITY FOR UNIO ELLIPSIS LEA.—While collecting in the vicinity of Florence, Alabama, the past summer, eight specimens of this species were found in the Tennessee river.—A. A. Hinkley.

MR. EDW. W. ROPER, of Revere, Mass., gave his friends in Philadelphia and Washington a short but pleasant call recently.

Z. CELLARIUS IN WESTERN PENNSYLVANIA.—I found 3 specimens of *Zonites cellarius* Müll., 2 living and 1 dead, from the Phipps Conservatory in Allegheny City, and as the 3 specimens came from 3 different greenhouses, they must have obtained a pretty good foothold. None of the shells were fully mature, the dead one being the largest.—Geo. H. Clapp.

THE RATE OF GROWTH OF HELICES.—I have placed mature *Helix appressa* in a box the middle of May. They have laid eggs,

the eggs have hatched, and the animal has grown to maturity by the first of November. With *Helix alternata* the growth was much less, hardly making more than one-half that of *H. appressa*.—Chas. S. Hodgson, *Albion, Ill.*

ARGONAUTA ARGO on the East Florida coast.—A specimen of this species measuring $7\frac{3}{8}$ inches diameter, and perfect in every respect, has been obtained by Mr. Wm. P. Stanley. It was found about 10 miles below Palm Beach, and contained the animal when cast ashore.

RECENT PUBLICATIONS.

OBRAS MALACOLOGICAS DE J. G. HIDALGO. Madrid, 1894. The name of JOAQUIN GONZALEZ HIDALGO has long been a familiar one to conchologists acquainted with recent French and Spanish literature of mollusca; and whoever has used the more extended works "*Moluscos Marinos de Espana, Portugal y las Baleares*" and the "*Moluscos Terrestres*,"—works indispensable in the study of the shells of Southwestern Europe—will hear with pleasure of the publication of the "*Obras Malacologicas*." This *magnum opus*, of which several parts lie before us, will consist of three portions: works relating to the fauna of Spain, works upon the South American fauna and publications on the land shells of the Philippine Islands. Of the former two we may judge in advance by the magnificently illustrated volumes named above, and the "*Moluscos del Viaje al Pacifico*."

That upon the Philippine fauna, now in course of publication, aims to present a summary of the literature of each species, with valuable critical notes on the variations, distribution, etc.; and it is illustrated on a scale which leaves little to be desired. The land snails of the Philippines are among the most beautiful of any region, and it is only fair to say that for the first time justice is done them in the splendid plates of Hidalgo's *Obras*. The *Helices* and *Cochlostylas* are illustrated in the parts already issued, and we hope to have the *Bulimi* and *operculates* before long. The text is characterized by its moderate and conservative spirit, refreshingly free from "*nouvelle ecole*" vagaries, but well abreast of the times.

The work will doubtless be of the greatest assistance to all students of this rich fauna, and we hope that its talented and industrious author may succeed in bringing it to a good completion.

LIST OF TEXAS MOLLUSCA collected by J. D. Mitchell. This catalogue embraces both marine and fresh-water forms, and adds many localities to the published records of Texas shells.

NOTES ON SOME MARINE INVERTEBRATA FROM THE COAST OF BRITISH COLUMBIA, by J. F. Whiteaves. A new *Pecten*, *P. (Pseudamusium) vancouverensis* is described and figured, and an adult specimen of *Turricula cidaris* is for the first time illustrated.

A CONTRIBUTION TO A KNOWLEDGE OF INDIANA MOLLUSCA, by R. Ellsworth Call (from Proc. Ind. Acad. Sci., III). The present paper is a preliminary list of the Indiana mollusk fauna, showing what has already been done toward an exact knowledge of the conchology of that State. Only authentic locality references are given, and nothing is admitted to the list on the strength of its occurrence in neighboring States. Of land shells, 58 species are enumerated; fresh-water univalves, 47 species; bivalves, 102 species. No less than 53 species were originally described from Indiana localities. A bibliography is given, both of special and general works bearing on Indiana shells. The "Contribution" is a step in the right direction, and will be welcomed by both Indiana collectors and those interested in the distribution of United States shells generally.

NOTES ON THE MIOCENE AND PLIOCENE OF GAY HEAD, MARTHA'S VINEYARD, MASS., ETC., by W. H. Dall (Amer. Jour. Sci., Oct., 1894). The result of Dall's visit to this locality, examined by Lyell 50 years ago, and by numerous other geologists later, are important, verifying its reference to Miocene, in which it corresponds to the Chesapeake, "in all probability to the upper part of the Chesapeake, certainly not lower than the St. Mary's fauna, and probably between that and the Yorktown beds." At about 80 feet above sea level a small patch of shell fragments was found, in a stratum of sand, which is considered Pliocene. *Nucula shaleri* and *Macoma lyelli* are described as new from the Miocene; and *Chrysodomus stonei* Pilsbry, originally described from stray specimens washed ashore on the New Jersey coast, was found, thus fixing its position, hitherto unknown, in the Miocene.

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A MONTHLY
DEVOTED TO THE INTERESTS
OF CONCHOLOGISTS.

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ASSOCIATE EDITOR :

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Vol. VIII.

DECEMBER, 1894.

No. 8.

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THE NAUTILUS.

VOL. VIII.

DECEMBER, 1894.

No. 8

. A SHELL HUNT FORTY FEET UNDER THE SEA.

BY C. HEDLEY, SYDNEY, AUSTRALIA.

To widen the fairway of Port Jackson (Australia), a submarine reef is being removed. An opportunity of going down with the divers employed thereon was kindly offered to myself and a scientific friend by the officer in charge of the operations. So tempting an invitation was, of course, accepted with delight. Often in imagination had we wandered on the ocean floor, peering into ghastly wrecks of ships sunk long ago, fighting with some huge shark or monstrous octopus, and gathering treasures of science or heaps of gold. Now our dreams were to come true and we were indeed to tread that fairy-land. We might not have the luck of the mariner in the song who

“ Fell overboard in a gale,
And found down below where the seaweeds grow,
Such a lovely maid with a tail,”

but we should certainly pluck strange growths at the bottom of the sea as one might pick flowers in a meadow.

A trim launch sped with us from Circular Quay down the famous Sydney Harbor, past bay after bay, some lined with wharves and shipping and some with trees growing to the water's edge, by rocks and white sandy beaches, past point and headland gay with villas and gardens, or sombre with eucalypt forest. So familiar was the

scene to us, that we smoked and chatted, unmindful of its beauties, till we reached a flotilla of punts and barges moored near the Heads.

After a cup of tea with the overseer, we prepared for our descent by divesting ourselves of boots, coat, vest and collar. A couple of laborers officiated as my *valets de chambre*, wrapping me first in thick flannel socks, trousers and jacket, and then in a canvas overall garment which left only the head and hands uncovered. The hands being left bare, the sleeves were secured at the wrists by rubber cuffs and bracelets. My feet were thrust into a pair of enormous boots, each sole of which was weighted with 25 pounds of lead. Bending my head, two men placed over it a huge diver's helmet and screwed it into a brass collar of the canvas dress. My costume completed by slinging on chest and back two large metal weights, I was told to rise. Thus encumbered, it was no slight exertion to get up, take three steps to the ladder, and descend into the water knee-deep. There I halted while my signal cord was belted round my waist; my air-tube, which reminded me of a garden hose, was screwed to my helmet and the pump commenced to force air through it. Finally an attendant screwed a plate-glass front, the size of a saucer, into my helmet; from the inside, this last operation resembled the closing of a coffin-lid. Some one tapped my helmet twice, the submarine signal for "all's well," and I started.

Stepping off the bottom rung of the short ladder, down I went, till the keel of the barge loomed up, rose and passed me—down, down into the green sea water, watching the silvery bubbles stream upward—down, down, down, as the water darkened. That sensation of gliding down into an emerald abyss, was the weirdest, dreamiest thing I ever felt. Then so gently did I alight, that I merely noticed that I had ceased to fall. At my feet I saw rock and sand and seaweed; looking up, I saw a monster in a helmet with two ropes leading away up to where the sky ought to be. The monster's face showed through his little window as a big, fair moustache and a pair of kindly blue eyes. Fetching out of a capacious trouser pocket a small school slate, he wrote, "How do you feel? Shall we go on?" and held it up. Taking his slate, I wrote, First rate; go on." He read the message, gravely rubbed the slate clean with his finger, pocketed it, and held out his hand. I grasped it and we started for a walk at the bottom of the sea.

Then I noticed a pain in my ears; the compressed air was hurting me. To cure it, I went through the motion of swallowing once

or twice. Feeling more comfortable, I "began to take notice," as they say of the babies. The light was bright enough to see small things plainly twenty feet away, but the water strangely magnified familiar objects. A shoal of little fish passed us, swimming under our arms and between our legs in the most ridiculous way. I tried to take one with my hand, but it deftly turned and avoided my grasp. The guide, seeing my attempt, pinned one to the ground with an iron rod he carried, and handed it to me; another he stabbed and caught as it swam by. Before we had gone far I had lost all sense of time, space or direction, and became too confused to know whether I had travelled east or west, ten yards or a hundred, in ten minutes or half an hour. A queer sensation was that of having escaped from the law of gravity; it seemed just as easy to walk up as down a cliff—we usually walked on our toes, sloping from the ground at an angle of forty to sixty degrees. When too much air is pumped down, the submarine pedestrian is unduly buoyant, and his aims to clutch a shell from the ground must be comically like the dodging and staggering of a drunken man.

A little dell lay before us choked with rank seaweed, through which we strode waist-deep like plunging into a tangle of fern in some damp valley on the land. My guide reached out, picked something off a broad frond, and handed it to me. It was a *Doris*, a lovely creature, whose like I never saw in books, striped with purple on a milk-white ground. It began to crawl over my fingers quite unconcernedly. I clapped my hands and tried dumbly to express my delight by patting my companion's big fist. He replied by offering me the slate, on which I wrote, "Very good; put him in the bottle." Rubbing out my words, he wrote, "Send down the bottle," tied the slate to the rope and jerked the latter four times. Away went rope and slate to the regions above. In response to an answering signal, the slack was hauled in and my collecting-jar descended tied to the rope. In turn, we tried in vain to open it. Although our correspondent above had filled the bottle with water, the pressure at our depth so sealed it that we could not raise the stopper. With a message on the slate, "Open this bottle and send it down open," we sent the jar aloft. When it was lowered to us the second time, I found that my *Doris* had slipped unobserved through my fingers, and so I lost a possible new species, the rarest treasure I was to see that day.

Continuing our travels in the dim water-world, we passed through a field of sponges. Not the brown, round masses of the bath-room, but radiant growths of scarlet (*Raphyrus hixoni* and *Halicondria rubra*) and purple, here and there great open oscula, tempting one to poke in a mischievous finger. Some grew in tufts like moss, some expanded like a dainty vase (*Phyllosiphonia caliciformis*), some forked like branches of trees and some spread like a lady's fan. One abundant species, about the size and shape of an orange, was pure ice-white, studded with golden dots that almost glittered (*Leucondra* sp.). Of all these we gathered what we could, pricking our hands sore with sponge spicules as we worked. When, on the morrow, our ravished beauties lay dead on a table in the museum, they had faded sadly from their pristine splendor. Among the sponges grew purple *Boltenia pachydermatina*, a pear-shaped head upon a slender stalk, like tulips in an earthly garden.

For a surprise, the diver held up before my face and pressed an *Aplysia*. From it flowed a violet stream which stained the water for two feet around, hiding hand and mollusk in the cloud. One of my last captures was an exquisite nudibranch, which swarmed on the broad fucus blades. In hue it was the blue of a summer sky, flecked with blood-red dots and stripes. I had now grown weary; not of searching for wonders, but of supporting the heavy diving armor, and was content to be drawn up again to the world of air and sunshine, which I had quitted three-quarters of an hour before.

On reflection, I found the reward of my under-water foray to be, not a hoard of specimens, but a better appreciation of the circumstances under which marine life exists. Our party of four had only observed, dead or alive, *Chamostrea albida*, *Vola fumata*, *Trigonia lamarecki*, *Struthiolaria scutulata*, *Drillia oweni*, *Cassia pyrum*, *Cypræa xanthodon*, *Astraliu tentoriforme*, *Ranella leucostoma*, *Aplysia keraudreni*, *Chromodoris bennetti*, and two undetermined *Doris*. Molluscan life seemed, on the spot I explored, to be less plentiful than at low-tide mark. Perhaps, however, the difficulties under which I labored as a beginner in the art of diving, impeded me from finding what was really there. After seeing the rough sea floor, one wonders that a dredge should capture as much as it does. A rich harvest probably awaits a conchologist who should seriously practice diving as a means of collecting.

VERTIGO MORSEI, n. sp.

BY DR. V. STERKI.

Shell large (for the group), cylindrical-turriculate, with a rather acute apex, imperforate rimate, with few obsolete striae of growth, shining, translucent; whorls six, rather slowly and regularly increasing, the last scarcely higher than the penultimate and rather narrower, somewhat sloping towards the base, slightly ascending at the aperture; suture deep; aperture lateral, scarcely oblique, comparatively small, inferior and palatal part well-rounded, the latter with an angular impression and slightly protracted in about its middle, the upper half more strongly curved, peristome everted; on the palatal wall, at some distance from and parallel with the margin, a moderate crest, behind it a deep and large impression over the palatal folds, and in front of it a groove corresponding with the impression at the auricle; inside the crest there is a distinct callus of the same color as the shell; apertural lamellae and folds typically nine: three on the parietal wall (the same as in *V. ovata*), the largest whitish; two on the columella, the superior strong, vertical above, then in an angle turning horizontally, the inferior horizontal, lamelliform, thin, high and directed obliquely upward; basal small, sometimes double, rarely 0; palatals high, and rather long, curved and directed upward; suprapalatal small, nodule-like.

Size: alt. 2·7, diam. 1·3; apert. alt. 0·9, lat 0·8 mill.

Soft parts not examined.

Habitat: Kent County, Michigan.

This magnificent *Vertigo* has been collected by Dr. DeCamp and kindly sent for examination by Mr. Bryant Walker. There were seven specimens, all fully mature, well-formed and almost exactly alike. Yet there are some slight differences, as they may be found in all forms of this group: in one example the inferior parietal tooth is wanting, in another the basal only trace-like, and in a third the same is double, as frequently found in *V. ovata*. With the latter species, *V. morsei* has much resemblance, especially in the aperture: the configuration and the "teeth" are the same, but the inferior columellar, and the two principal parietals, are rather larger, and markedly directed upward. The main difference is in the number and relative size of the whorls: while in *V. ovata* they are five, and rapidly increasing, the last predominating; in our species there are six, slowly increasing, the last, and consequently the aperture, com-

paratively small. This is a radical difference, and gives the shell quite another aspect, so that there can be no question about its being distinct. But *V. morsei* is also decidedly larger, *V. ovata* not, or little, exceeding two millimeters of altitude.

The species is named in honor of Mr. E. S. Morse, who has so considerably promoted our knowledge of the Pupidae.

New Philadelphia, Ohio, Nov., 1894.

A NEW CHITON FROM CALIFORNIA.

BY W. H. DALL.

Genus *LEPIDOPLEURUS* Risso.

Section *Lepidopleurus* ss. Valves adjacent, jugal area obscure, not separated from the pleural tracts; lateral areas distinct, or feeble, when all the sculpture is feeble. Type *L. cajetanus* Poli. Mediterranean.

Section *Oldroydia*. Valves separated by narrow extensions of the girdle, reaching to the jugum; jugal area prominent, sculptured differently from the pleural tracts and extending in front of them between the sutural laminæ; lateral areas not differentiated; valves heavy, strongly sculptured. Type *L. (O.) percrassus* n. sp.

Lepidopleurus percrassus n. sp.

Shell solid, strong, small, of a pale pinkish-brown with a darker brownish girdle which appears rather narrow in the dry state; scales very minute, partly dehiscent, chaffy, with occasional slender spinules resembling hairs; scales on the base crowded, minute, sandy; an extension of the girdle is prolonged between the valves on each side as far the jugum, the surface of these sinuses is also minutely scaly with occasional spinules; valves thick, white below, moderately arched with the prominent jugum forming a sort of keel; near the points of insertion the valves are heavily callous below; the sutural laminæ are short, smooth and separated at the median sinus by a prolongation of the jugum in advance of the anterior margins of the pleuræ; sculpture of the jugum consisting of punctate fore-and-aft parallel grooves with some small elevated transverse ridges anteriorly; the rest of the valve has, on each side, six or eight vermicular ridges divaricating toward the posterior edge of the valve and irregularly corrugated with sharp, fine, elevated

lamellæ crossing the interspaces transversely but fading out on the ridges; head-valve with minutely nodulous concentric ridges; tail-valve highest at the subcentral, not very prominent mucro, in front sculptured like the intermediate valves, behind the mucro like the head-valve. Length about 14, width 5.75, height 2.5 mm., in the dry state. The dry girdle about half a millimeter wide.

Specimens obtained by Mr. T. S. Oldroyd from a stone pulled up from about 75 fathoms in the Santa Barbara Channel off San Pedro, California.

This species, for which a section named in honor of Mr. Oldroyd is proposed, is very remarkable. The girdle recalls that of *Deshayesiella* Carpenter, but is extended in such a manner as to partly separate the shelly portions of the valves. The very callous surfaces of the interior, according to Mr. Pilsbry, are unique in the group. Most of the species of *Lepidopleurus* are comparatively thin, and though *L. cajetanus* is a solid shell, none of the species are as heavy as the present one in proportion to their size. The conspicuous and forwardly produced jugum is unique in the family. The type is in the National Museum, and will be figured later.

PATELLA (HELCIONISCUS) NIGRISQUAMATA REEVE.

BY CHAS. T. SIMPSON.

In the collection of the National Museum are twenty specimens of *Patella* bearing the above name received from Frederick Stearns, the U. S. Exploring Expedition, W. K. Fischer, and the Lea-Chamberlain Collection—the latter credited to “Dr. R.” by Mr. Lea, and probably from Ruschenberger. One other specimen of the same name is in the museum from the Rich Collection without locality.

These vary from young shells less than an inch in diameter to those which are more than $3\frac{1}{2}$ inches in length. There can be no doubt that the above name is correct, as all the specimens agree fairly well with Reeves' description and excellent figures in the *Cochologia Iconica* (Vol. VIII, *Patella*, species 3, plate II, figs. 3^a and 3^b).

The species described as *P. boninensis* in the NAUTILUS (Nov., 1891, p. 79), was characterized by its author as having a large central muscular callus, and two diverging dark bands from the anterior head segment.

Our large series shows every possible variation in the development of these characters, from young specimens in which no scar or tails (for they look very much like squirrel tails) are visible, to old, solid shells with a heavy, snowy, swollen callus, and having these brown wings very strongly developed.

The same characters are seen in *Patella* (*Helcioniscus*) *argentata* Sowb., better known as *P. talcosa* Gld. *H. clypeater*, which Mr. Pilsbry places with *Nacella*, on account of slight differences in anatomical characters, but which, conchologically, seems closely allied to *P. argentata*, and in other species.

In short, there can be no doubt that this scar and the curious radiating brown lines are merely adult characters which are developed in quite a number of species. I quite agree with Mr. Geo. W. Taylor in believing that this species does not come from the west coast of South America, but is probably confined to the north-western part of the Indo-Pacific region.

THE VIRGINIA COLONY OF *HELIX NEMORALIS*.

BY T. D. A. COCKERELL, N. M. AGR. EXP. STA.

There appeared in the NAUTILUS, of Nov., 1889, a paper under the above title, setting forth some very interesting facts regarding the variations exhibited by a colony of *H. nemoralis* at Lexington, Va. Prof. J. H. Morrison, who collected the shells studied, took considerable interest in the matter at that time, and had gathered together a good deal of information additional to that given in the above-cited paper. I have, therefore, been quite disappointed not to see any publication by him on this subject, or any evidence that the colony has received further attention.

It is scarcely necessary to dwell on the extreme interest attaching to the history of this colony. Here we have a variable species introduced into a new country, and varying in a most extraordinary manner under the influence of the new environment. The peculiar variations are very numerous, though, in the main, tending entirely in one direction—to the splitting of the normal bands. Although the number of individuals thus varying is considerable, very few of such have exactly the same formula, whereas, several of the old European variations occur in numerous specimens.

It appears, in the highest degree, probable that these peculiar variations are congenital and not acquired during the lifetime of

the individual,¹ in which case we have an example of environment modifying the germ-plasm—the odds against the variation being only accidentally coincident with the changed environment being enormous.

In 1889, the above-mentioned changes had taken place in the colony, but time was needed to show whether they would increase in number and degree; or whether, as seemed more probable, the old European varieties would eventually assert themselves, and swamp the rest. In either case, the result would be very interesting, and now that five years have elapsed, it is extremely desirable that some one should make a new investigation and report in detail. It is really astonishing that no one has yet done so. The colony was, in 1889, so evidently in a condition of unstable equilibrium, that it seems certain that changes must have occurred in the interval, tending to the predominance either of the old or the new (split-band) type.

Believing that Prof. Morrison would publish, I did not follow my paper of 1889 with further observations, but it will be as well now to put the following on record:

(1) Lexington, Va., received from Morrison one of each of the following, Oct. 26, 1889:

Helix nemoralis mut. *guettardia* Moq.

Helix nemoralis mut. *arcelinia* Loc.

Helix nemoralis mut. *petiveria* 10345 = *requienia* Moq.

Helix nemoralis mut. *libellula* 1(234)5 Kregl.

Helix nemoralis mut. *libellula* 123(4)5 nov.

Helix nemoralis mut. *libellula* 0030₅ Ckll. (juv.).

Helix nemoralis mut. *libellula* 12,45 Ckll.

Helix nemoralis mut. *libellula* 1,23₂(45) nov. (juv.).

Helix nemoralis mut. *libellula* 12,3(45) nov. (juv.).

(Morrison had another example.)

Helix nemoralis mut. *libellula* 12,3(44)5 nov.

(Morrison had another example.)

Helix nemoralis mut. *libellula* 1,0₅45 nov. (juv.).

Helix nemoralis mut. *libellula* 12₂3₂45 nov. (juv.).

Helix nemoralis mut. *libellula* 1,234(5₅) nov. (juv.).

Helix nemoralis mut. *libellula* 123,45 nov.

Helix nemoralis mut. *libellula* 12₂₂3₂₂45 nov.

Helix nemoralis mut. *libellula* 003,5 Ckll.

¹ If so acquired, it must be in very early life, as, in many instances, the variations were recorded from immature examples.

Helix nemoralis mut. *libellula* 12_s(45) Ckll.

Mr. Morrison also sent me word of the occurrence of mut. *libellula* 0030_s Ckll.

(2) Lexington, Va., received from Morrison in November, 1889:

H. nemoralis mut. *libellula bimarginata* 12_x345 nov.

(the bands tend to coalesce.)

H. nemoralis mut. *libellula* 12345 Moq.

H. nemoralis mut. *libellula bimarginata major* 00000 Moq.

(thin, max. diam. 28½ mm.)

H. nemoralis mut. *libellula major* 12345 Moq.

(max. diam. 26¾ mm.)

H. nemoralis mut. *petiveria* (12345) = *richardia* Moq.

H. nemoralis mut. *petiveria umbilicata* 123₄₅ Ckll.

(nov. mut. *umbilicata*, shell more globose, umbilicus open.)

H. nemoralis mut. *libellula* 1234445, nov. = *morrisonia* nov.

(extra bands 44, much thinner than 4.)

H. nemoralis mut. *albescens* 00000 Moq.

(pale yellow, like mut. *subalbida* of *hortensis*.)

(3) Lexington, Va., not seen, recorded by Morrison in litt., Nov. 16, 1889.

H. nemoralis mut. *libellula* (12)(345) Kregl. (one).

H. nemoralis mut. *libellula* 120(45) Kregl. (one).

H. nemoralis mut. *libellula* 1_s045 nov. Morr. (two).

H. nemoralis mut. *libellula* (123)45 = *nilssonina* Moq. (one).

H. nemoralis mut. *libellula* 1234455 nov. Morr. (one).

H. nemoralis mut. *rubella* 123(45) Moq. (four).

H. nemoralis mut. *rubella* 10345 Moq. (three).

H. nemoralis mut. *rubella* 123X45 Ckll. (one).

(4) Lexington, Va., not seen, recorded by Morrison in litt. Jan. 2, 1890. This is the most extraordinary series of all; about all the band-variations are new.

Mut. *petiveria* 12_{xx}45. Mut. *libellula* 1(22)045.

Mut. *petiveria* (12)3(45) Moq. Mut. *libellula* 1234(55).

Mut. *libellula* 1_{ss}45. Mut. *libellula* 12(33)45.

Mut. *libellula* 12_x3_{xx}45. Mut. *libellula* 1_s3_x4_s(55).

Mut. *libellula* 12(_s3)_x(45). Mut. *libellula* 12_s3_s4(55).

Mut. *libellula* 123(45) *bimargin-* Mut. *libellula* 1(22)3(45).

ata. Mut. *libellula* 123_s(4445).

Mut. *libellula* 123_x45 Ckll. Mut. *libellula* 1(2_s)345.

Mut. *libellula* 123_{xx}45. Mut. *libellula* (1_s2_s3_{ss}4_s555).

Mut. *libellula* 123_{xx}(45). Mut. *libellula* 123_s45.

- | | |
|---|--|
| Mut. <i>libellula roseolabiata bimarginata</i> 12345. | Mut. <i>libellula</i> 123(44)5. |
| Mut. <i>libellula</i> 123(4) ₁ 5. | Mut. <i>libellula</i> 1234 ₁ 5. |
| Mut. <i>libellula</i> 123(4) ₄ 5. | Mut. <i>libellula</i> 1(22)345. |
| Mut. <i>libellula</i> 12 ₁ 345 Ckll., <i>bimarginata</i> . | Mut. <i>libellula</i> 1 ₁ 03 ₁ 45. |
| Mut. <i>libellula</i> 12 ₁ 345 Ckll. | Mut. <i>libellula roseolabiata bimarginata</i> (12345). |
| Mut. <i>libellula</i> 12 _{ss} (4445). | Mut. <i>libellula</i> 1 ₁ 3 ₁ 45. |
| Mut. <i>libellula</i> (1 ₂ _{xx} 3 ₃)(45). | Mut. <i>libellula</i> (12 _{ss} 45). |
| Mut. <i>libellula</i> 103(44)5. | Mut. <i>libellula</i> (12 _{ss} 45). |

It should be explained that a split-band bracketed, as (44), means that it is split, but joins near the mouth of the shell.

NOTES AND NEWS.

MR. T. WAYLAND VAUGHAN is now engaged in geological work on the scientific corps of the U. S. Geological Survey.

MR. GILBERT D. HARRIS, formerly of the U. S. Geological Survey, has, after spending the summer abroad, taken up the work of his new appointment at Cornell University, where the valuable collection of mollusks, of which Dr. Newcomb was so long curator, is under his charge, as well as the Palæontological Department.

THE LONG BEACH (CALIFORNIA) CONCHOLOGICAL CLUB elected the following officers for the next year: Miss I. M. Shepard, President; Mrs. M. Darling, Vice-President; Mrs. Terry, Treasurer and Secretary, with Miss E. Lowe her assistant.

The Club is to hold its meetings twice a month. The following are the charter members: Miss E. Lowe, Mrs. M. Darling, Mrs. E. Cushman, Mrs. R. Preston, Mrs. Terry, Mrs. Craig, Miss I. M. Shepard and Mrs. Dial. At the next meeting, to be held December 1, new members will be received. The Club has been studying and collecting for a year, but had not before formally organized.

They held their first Annual Meeting and Reception at the home of Miss E. Lowe, on the evening of October 6. A short program was given and letters of greeting read from Dr. W. H. Dall, Mr. H. Hemphill and Prof. Josiah Keep. Ice cream and cake were served in shells, and the rooms handsomely decorated with palms, shells, kelp, and smilax.

The Club would be glad to hear from any and all interested in the same study, and will make a special study and collection of our local shells or shells of Los Angeles Co.

AMNICOLA OLIVACEA PILS.—In April, I visited the original lo-

cality (Huntsville, Ala.) and was surprised to find this species in vast numbers. The stream has a mud bottom which is much indented with cow tracks. In these the *Amnicola* had congregated—not as a layer on the surface, but as a solid mass. To get an idea of how many there were I scooped up the contents of three holes, and after washing them thoroughly, found I had a full quart of the living animals. There must have been bushels of them in the few rods of stream which I inspected. The stream receives some of the city sewerage, so it is probably a good feeding-ground.

The geese which infest the neighborhood do not seem to care for this species.—H. E. SARGENT, *in lit.*

NEW PUBLICATIONS.

THE LIFE AND WRITINGS OF CONSTANTINE SAMUEL RAFINESQUE, by Richard Ellsworth Call, is announced to be published in January next. The volume will be in quarto form, and issued in paper only. It will contain several full-page illustrations, one of which will be a portrait of its subject. A complete bibliography of the writings of Rafinesque, on every subject, comprising over four hundred titles, will be included, together with a certified copy of his will, one of the most remarkable testamentary documents ever probated. It will prove of exceptional value to those interested in botanical, conchological, or ichthyological matters.

A MONOGRAPH OF THE LAND AND FRESHWATER MOLLUSCA OF THE BRITISH ISLES, by J. W. Taylor, F. L. S., is announced as in press. The object in issuing this work is to bring together, as far as practicable, all reliable information bearing upon the study of the British Land and Freshwater Mollusca. It will aim to combine the information upon all aspects of the study, and thus form a standard work of reference as well as a reliable text-book upon British Land and Freshwater shells. The first volume will be devoted to general characters of the shell, the morphology of the animal, geological and geographical distribution, habits, parasites, etc. The second volume will be devoted to the treatment of species individually, and will aim to give accurate descriptions and faithfully colored figures of the typical shell and the chief varieties of every species; the various organs of the animal will be described and illustrated in the text, and full lists of localities, with a full synonymy will also be given, as well as observations upon the habits and peculiarities of each species. Mr. Taylor's work promises to be a timely and useful one. Fuller notice will be given upon the appearance of the first volume.

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THE NAUTILUS

A MONTHLY
DEVOTED TO THE INTERESTS
OF CONCHOLOGISTS.

EDITOR :

H. A. PILSBRY, Conservator Conchological Section, Academy of Natural Sciences, Philadelphia.

ASSOCIATE EDITOR :

C. W. JOHNSON, Curator of the Wagner Free Institute of Science.

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JANUARY, 1895.

No. 9.

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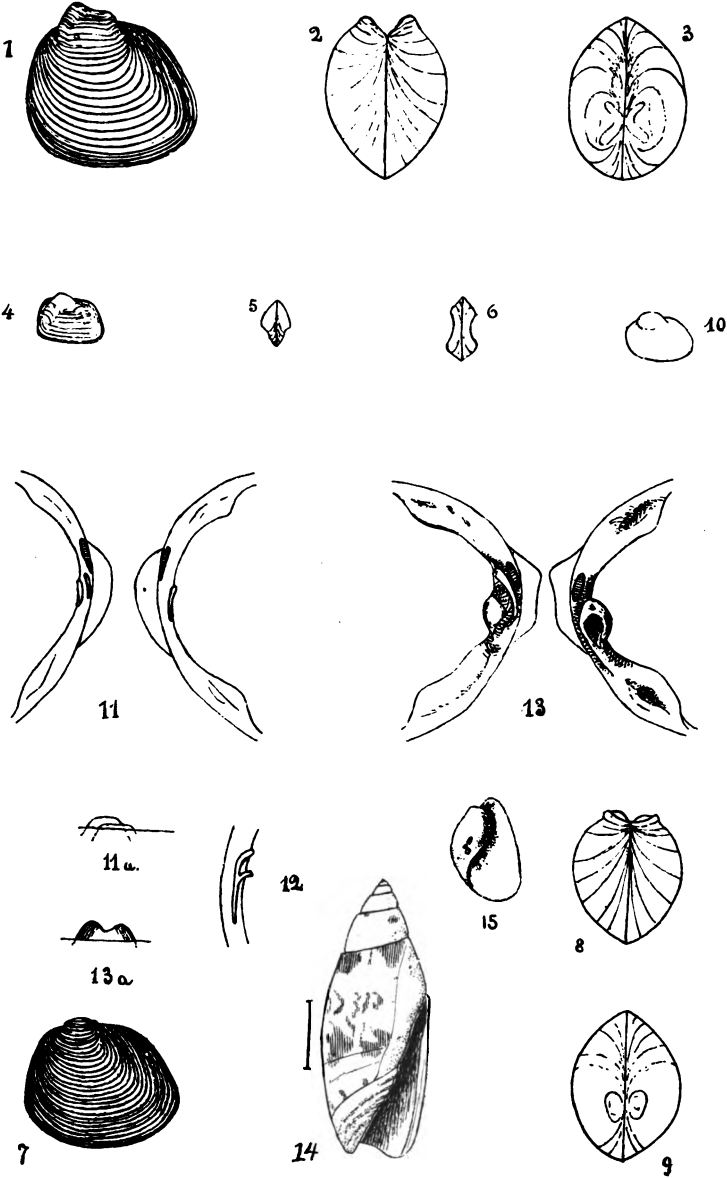
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H. E. SARGENT, Woodville, Ala.



1-6, 13, 13a, *Pisidium cruciatum* Sterki. 7-12, *P. punctatum* Sterki.
14, *Olivella gracilis* v. *Gaylordi* Ford. 15, *Haminea virescens* Sowb.

JAN 3 1895

THE NAUTILUS.

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TWO NEW PISIDIA.

BY DR. V. STERKI.

Pl. II, Figs. 1-13.

Pisidium cruciatum, n. sp. Figs. 1-6, 13, 13a.

Shell minute, inequipartite, oblique, subtriangular in outline, high, ventricose, regularly and comparatively coarsely striated, straw colored; anterior part moderately long with an oblique, nearly straight edge above and the end rounded; posterior part short, the end somewhat obliquely truncate, superior margin rather strongly curved, scutum scarcely, scutellum little marked, the latter forming a rather distinct angle; inferior part moderately curved; beaks prominent, each with two ridges diverging at nearly right angles, together forming a cross on the upper aspect of the shell, each of the ridges ending in a nodule of which the posterior is larger and more prominent; nave rather thick, whitish; hinge very stout, list strong; cardinal teeth rather large, and strongly projecting inward from the hinge list; in the right valve one, strongly curved, posterior part thick, anterior thin, lamellar, the ends united by a lamella so as to form a deep groove into which the posterior tooth of the left valve articulates; in the left valve two, the posterior (inferior) stout, massive, the other, superior and a little anterior, rather short, fine, lamellar, oblique, little curved; lateral teeth large, high and pointed in the left, strongly projecting inward in

the right valve, the latter with no (or only traces of) outer teeth, and a deep groove; between the cardinal and the lateral teeth the hingelist is rather deeply excavated, so that all teeth are markedly isolated; muscle insertions visible; ligament, short, strong.

Size; long 1.9, alt. 1.9, diam. 1.4 mill.

Soft parts slightly yellowish.

Habitat: Tuscarawas River, at New Philadelphia, Ohio.

Figure 1 represents an adult specimen, 2 the posterior, 3 the dorsal aspect, 4-6 a young example, 0.8 mill. long; fig. 13 the hinge; 13a the dorsal aspect of the right cardinal tooth with an indentation; figs. 1-6: scale 15×1 .

The singular shape of the umbones is so characteristic that this species will be recognized at once, and cannot be mistaken for any other. And also in the formation of the hinge it is quite unlike any other *Pisidium*, so that it holds a peculiar position in the genus. In the hinge structure it is very illustrative and instructive for the understanding of the different forms of cardinal teeth; yet this is not the place to discuss the subject at length.

Our species is rather variable, even so that all specimens from one place in the river are different in size and shape from those of another place scarcely half a mile distant. It measures from 1.6 to 2.1 mill. (One specimen 2.1:2.1:1.6, another 1.7:1.7:1.3 mill.), 1.9 being about the average; the margins may be rather obtuse or somewhat acute, the beaks more or less prominent, and the anterior nodule more or less marked. As a rule there are no outer lateral teeth in the right valve, yet traces of them may be seen in some specimens. Also in the formation of the cardinal teeth there is some variation, as the one in the right valve may be indented in its middle, at the angle, and so there are apparently two teeth (fig. 13a).

Pis. cruciatum is not rare in the Tuscarawas River, where, so far, it has only been found, but probably it has a wider distribution, and may even have been collected and taken for the young of some other species, owing to its minute size. In October and November, 1891, it was first found, and some specimens were sent to several conchologists, so to Mr. E. W. Roper, who also recognized it as a new species. In 1893 and 1894 about a hundred were collected, in all stages of growth. Only few of them are quite mature, and almost globular, most adolescent, and, though apparently old, much less inflated. They live in mud among aquatic plants and dead leaves,

and, as a rule, are covered with a black or brown coat, sometimes so thick that they appear to be globules of dirt, and only a sharp eye may recognize them from the hair-like free line along the edge. Some old specimens are badly eroded.

Pisidium punctatum, n. sp. Figs. 7-12.

Shell minute, inequiptartite, high, oblique, strongly ventricose, almost globular, regularly and sharply striated, microscopically rugulose, whitish; anterior part moderately long, the edge above oblique, almost straight, end slightly angled, rather inferior; anterior part short, truncate, slightly angular above, rounded below; superior and inferior margins moderately curved, the former rather short, the latter long; scutum little, scutellum moderately marked, both forming slight angles; vertical section heart-shaped, horizontal, short, lanceolate-rhombic; margins very slightly acute; beaks moderately full and prominent, with a longitudinal, slightly oblique ridge (sometimes obsolete) below the culmination; navel moderately thick, whitish, with crowded, small pits, from which it appears as if dotted; hinge moderately strong; cardinal teeth fine, in the left valve two, lamellar, longitudinal, about equally long, a little curved, almost parallel, the upper little anterior; in the right valve one, longitudinal, little curved, lamellar, the posterior end slightly thickened; lateral teeth rather small and thin, in the left valve one, pointed, in the right valve two, the outer quite small; hinge-list fine, rather regularly formed; ligament rather long and fine.

Size; long 1.8, alt. 1.6, diam. 1.3 mill.

Soft parts colorless, rest whitish.

Habitat: Ohio; Tuscarawas River, Bear Run, tributary to the Mahoning River, Portage Co., a spring brook at Rootstown Station, Portage Co., emptying into the Cuyahoga River (Lake Erie and St. Lawrence drainage); in all places collected by the writer.

Figures 7-9 represent an adult, 10 a young specimen, scale 15×1; fig. 11 the hinge, 11a the dorsal aspect of the cardinal teeth in the left valve; fig. 12 shows a remarkable abnormality of the cardinal tooth in the right valve.

This species resembles somewhat *Pis. compressum* Prime, in having a ridge or appendage, but not in the same place, as it stands on the outside, below the culmination of the beaks, while in the mature *P. compressum* it has its place rather on top. The shape of the shell is different, and the size is very much smaller, its bulk being only about one-tenth of that shell. And while the upper part of

the posterior margin in *P. compressum* is rounded or flattened, it is sharp, somewhat "pinched" in *P. punctatum*. In this the shell is purely whitish, or light straw colored, the latter more so when dry, while the mature *P. compressum* is always more or less grayish. A marked feature is the finely and densely pitted interior surface of the shell, the dots being distinctly perceptible through the shell from the outside. Yet this is not unique, as I have also seen it in other *Pisidia*. Some specimens show not a trace of the appendages on the beaks, yet they are evidently identical.

In the Tuscarawas River this *Pisidium* appears to be rare, as only thirty were taken, twelve of them in one place, in company of about five hundred *P. compressum*, most of the latter quite young to half grown, *P. cruciatum* and a few *P. abditum*, which is common in pools and ditches. More frequent it is in the Bear Run, where about 120 were collected, but only one-fourth of them adult. Those from the spring brook mentioned above, are somewhat larger, averaging 2.0 millimeters long.

These two well characterized and very small *Pisidia* are a valuable addition to our molluscan fauna. Besides them there are several other undescribed species from our country at hand. These small mussels have been somewhat neglected and a more assiduous collecting and closer study will doubtless bring to light not only more unknown forms, but also interesting geographical relations.

New Philadelphia, Ohio, Nov., 1894.

HAMINEA VIRESCENS. (Pl. II, fig. 15).

BY MRS. M. F. BRADSHAW.

One afternoon in August, when the low tide of the month occurred, we went to our favorite reef of rocks to see what of interest new or old we could find.

There were acres of mussels with *Purpura saxicola* in great numbers and various colors wedged in between them. These *Purpuras* are graceful in form and often beautifully colored and striped, and I never tire of them. There were several species of *Acmæa* and *Fissurella volcano* plentiful enough, and as we reached the outside of the reef where the waves dashed at us threateningly, we found a few small *Haliotis cracherodii*, some sea urchins and starfish. These

last we left to the enjoyment of their home in the deep pools among the rocks.

But I wanted to tell you of the real "find" of my summer. On the flat surface of the rocks, and nearest the shore, were small indentations and shallow crevices. While looking into these in search of a possible new Chiton, I saw a gray object which I picked up with the remark that here was some sort of key-hole limpet.

My little companion says: "What is a key-hole limpet?" and so I took out my knife and was about to dissect it to give her a lesson in conchology, but to my surprise I found I had something quite new to myself.

I had very rarely picked up on the beach a small, pale yellow bubble shell never more than $\frac{1}{2}$ inch in length, but had no idea whereabouts this little mollusc had lived. But here in my hand was a real live Haminea, the pale greenish shell so nearly transparent, that it was excusable to at first think it was internal instead of on the creature's back.

The shell was about $\frac{1}{2}$ inch in length, and as we found none larger, was probably an adult, and it covered less than one-third of the mollusk.

The animal itself was a slimy gray globule, not pleasant to touch, and one could not help wondering what possible use or protection was this fragile, inconspicuous, insufficient shell.

Further search revealed several dozen, but they were hard to find even after we knew exactly what to look for, so nearly were they like their surroundings.

After that we searched for Haminea in all similar places for several miles of our coast, but never again found them; so I am still of the opinion that they are rare in this locality.

Monoceros engonatum is not rare on this coast I believe, but I never found them until that day, I got two, one a fourth of a mile from the other. Careful search failed to reveal more, though these individuals could not be living alone, and I have no doubt had only taken a short excursion, leaving the rest of their families safely at home.

The field of my observations has been but limited; situated about midway between Los Angeles and San Diego, but I think it is a locality rich in the number of its species.

NEW FORMS OF AMERICAN SHELLS.

BY H. A. PILSBRY.

Gastrodonta (Pseudohyalina) lateumbilicata n. sp.

Shell resembling *Ps. limatula* in color, texture and sculpture, but much depressed, the upper surface almost flat, last whorl of much smaller calibre, the umbilicus very much wider, shallow, its cavity widely open and saucer-shaped, much as in *Helicodiscus lineatus*. Alt. 1·4, diam. 4·3 mm.

Hab., near Woodville, Alabama. Coll. by H. E. Sargent, whose labors in northern Alabama have been remarkably fruitful in increasing our knowledge of the conchology and mammalogy of Alabama, as well as in his chosen work as an educator.

Somatogyrys Sargenti n. sp.

About the size of *S. aureus* Tryon, but shouldered as in *S. subglobosus* Say, and imperforate. Shell globose-turbinata, light olive-green, smooth except for fine growth lines. Whorls about 4½, those of the spire very convex and separated by deep sutures; last whorl shouldered above, flattened toward the suture, large and convex. Aperture large, ovate, a little flattened on the parietal side, broadly rounded below, narrowly rounded above, and angular at the upper insertion of the lip. Columella concave, moderately heavy, the callus becoming wider at the umbilical region; parietal wall with a transparent callus layer. Alt. 6, diam. 5 mm. Mud Creek, a tributary of the Tennessee R., Ala.; coll. by Prof. H. E. Sargent.

This species differs from *S. integer* and the closely allied species or varieties *depressus*, *aureus* and *parvulus* in its shouldered whorls, planulate below the suture. It has no such heavy columellar callus as *S. currierianus*; and it is a smaller species than *S. subglobosus* (isogonus) of Say, with wholly closed umbilicus and differently formed columella.

RANGIA. THE PROPER NAME OF THE MACTROID GENUS GNATHODON.

BY THEODORE GILL.

Mr. Dall, in the NAUTILUS (VIII, 27) and Proc. U. S. Nat. Mus., (XVII, 91), has shown that the generic name *Gnathodon* was

introduced before *Rangia* for the same genus of Mactroid bivalves. Nevertheless, the former name must give place to the latter, because it had been previously used in zoology for a different genus. Ever since Mr. Dall communicated to me the results of his investigations, I had a dim recollection of having seen the name used in another sense, and that *Rangia* would have to stand, but could not recall any circumstances connected with it. Having had occasion recently to refer to the Plectognath fishes, I recalled that the name *Gnathodon* had been given to a combination of the genera *Tetrodon* and *Diodon*, because neither of the latter was applicable to all the forms of the composite genus. It was Goldfuss in 1820 who thus used the name in his "Handbuch der Zoologie." I have not access at present to a copy of Goldfuss' work,¹ but have verified my recollection by reference to Cuvier and Valenciennes' "Histoire Naturelle des Poissons," (I, 226), where, in a summary of the work, the name is thus mentioned "*Gnathodon (Diodon Tetrodon.)*". Of course, the name is not active in ichthyology, and, also of course, it is not recorded in any of the Nomenclators of zoology, but, in accordance with the law "once a synonym always a synonym," the previous application of the name in ichthyology precludes its use in conchology.

A NEW VARIETY OF OLIVELLA.

BY JOHN FORD.

Some months ago, I received from my friend, Mrs. E. M. Gaylord, of Alameda, Cal., a suite of Olivella which had been found by her in a box of shells that apparently came direct from the Gulf of California.

All of the associated species were well known Gulf shells, and as the Olivella were in the same fresh condition as the rest, there was no reason to doubt that the entire lot had been secured simultan-

¹Handbuch der Zoologie, von Georg August Goldfuss, Nuernberg, 1820, being the Zweite Abtheilung of the Dritter Theil of Dr. G. H. Schubert's Handbuch der Naturgeschichte. *Gnathodon* appears on page 100, is suitably diagnosed, and includes as sections *Orthratoriscus* Schn., *Diodon* L. and *Tetrodon* L.—ED.

ously, and, probably, at the same locality. In view of this conclusion, also of the fact that the specimens are in some respects distinct from any heretofore known to me, or, so far as I can learn, to any writer on conchological matters, I assume the responsibility of naming and describing them as follows:

Olivella gracilis Gray. Var. *Gaylordi* Ford. Pl. II, fig. 14.

Shell similar in outline to *O. gracilis*, but much smaller, general color bluish-grey, with a well defined interrupted band of a lead-black hue bordering the upper part of the final or body whorl.

Smaller spots of a like hue also appear at the upper edge of the fasciole. Circling the middle portion of the whorl is a number of irregular brownish lines, which also occur less prominently on the fasciole. In some specimens a splotch or two of the same color as the interrupted band referred to, appears on the upper part of the preceding whorl. Apex very acute and free from spots. Length of aperture rather more than one-half that of the shell; dorsal portion of the extreme base creamy white. Average length of specimens 9 to 10 mm., width 3.2 to 4 mm. Hab., Gulf of California.

Mrs. Gaylord, for whom the variety has been named, is not only a practical collector, but an unusually earnest and capable conchological student also. It gives me great pleasure, therefore, to associate her name with the beautiful specimens referred to.

FERUSSACIA SUBCYLINDRICA AND TWO NEW SPECIES IN JACKSON
CO., ALABAMA.

H. E. SARGENT, WOODVILLE, ALA.

The pleasure which thrills the field naturalist upon locating with in his range, a species previously unknown to the region, must be experienced to be appreciated. It is my privilege at this writing to report three such finds.

Late last November, at the end of a shell hunt of two hours, which had among other things brought to light several fine specimens of *H. obstricta* Say var. *y*, I chanced to detect for the first time a specimen of *F. subcylindrica* L.

Its station was a flat surface rock about thirty feet square, at an angle of 30°, with a north exposure. Having a sack with us, my

assistant and I proceeded to "bag" the leaf mould. While doing so another new thing attracted my attention. Upon comparing it with a single specimen of *Z. limatulus* Ward in my collection, I pronounced it the same with a question and sent it to the Editor for verification. He writes "Your *limatulus* I find, on comparing with typical specimens, are much flatter and have wider umbilicus. I therefore, call them *Gastrodonta (Pseudohyalina) lateumbilicata* n. sp."

Daylight failing and being a mile from home in a ravine 500 feet below home level, and only the bed of a mountain torrent for foot-path, we could only carelessly collect the bushel of mould which we brought away, doubtless leaving many specimens. Upon assorting the material the following was the result:

Ferussacia subcylindrica L., 245. *Pomatiopsis lapidaria* 48.

Gastrodonta lateumbilicata Pils., 200.

G. capsella Gld., 25.

Z. indentatus Say, 18.

G. interna Say, 18.

Helicodiscus lineatus Say, 5.

Patula perspectiva Say, 51.

Helix spinosa Lea, 1.

H. stenotrema Fer., 3.

H. inflecta Say, 4.

A subsequent visit to another part of the same ravine resulted in the finding of 50 more specimens of *G. lateumbilicata*, but none of *F. subcylindrica*. I have since received two specimens of the latter from another locality not far distant.

This trip also resulted in the finding of two living specimens of *Gastrodonta acerra* Lewis, the gem of our American *Zonites*. A number were also found which had been broken into and eaten. Query; may not the rarity of this species be due to its delicate shell and habit of remaining among the loose leaves rather than burying itself in the mould as does its more thrifty neighbor *Omphalina laevigata* Pfr.?

This is thus far the only station at which I have found *G. acerra*.

A new species of *Somatogyrus* for which the name *Somatogyrus sargenti* Pils. is proposed, is found in considerable numbers, twenty miles northeast of here in a spring, tributary to Mud Creek, which is in turn tributary to the Tennessee River. It is found attached to the dead leaves in company with one species each of *Physa*, *Planorbis*, *Limnaea* and *Goniobasis*.

NOTES AND NEWS.

The Conchologists Exchange was started so oddly (on a postal card) and ended so abruptly—and without an index to either volume, that we are constantly receiving letters of inquiry regarding its contents, numbers, etc. We once proposed to make a reprint, but could not obtain sufficient subscribers to warrant it. We now propose to print an index of both volumes, if enough of our subscribers want it to pay for the cost of printing. The index will contain a list of contributors with the titles of their articles, and a list of the species mentioned. Those wishing an Index will please send twenty-five cents to the Editors. It will be printed as soon as sufficient money is received.—H. A. P. and C. W. J.

There is being built at Finderne, N. J., a large Casino Building, one room of which is to be devoted to Natural History. Mr. Thomas Morgan, of Somerville, N. J., has been appointed Curator. He intends placing there his entire collection. Any donation of specimens will be thankfully received.

DEAD SNAILS.—On the 14th of last April, (1894), I turned over a log in the woods in Miami Co., Ohio, and found, all in a heap, the following shells: 74 adult *Helix elevata*, 38 young of same, 1 *H. profunda*, 9 *H. alternata*, 1 *H. albolabris* and 2 *H. hirsuta*, making in all 125 individuals. They were all dead but well preserved, and many were clean inside so that they would make good cabinet specimens. Besides these perfect shells there were many so broken that they could not be readily identified.

How can we explain this? Did these mollusks seek the warmth to be derived from a number huddling together, or were they acted upon by the common impulse of protection? Were they destroyed by insects, or did they perish by the cold? The preceding winter was an unusually mild one, and the size of the log and quantity of leaves which surrounded them would preclude the latter theory. The fact that so many were so thoroughly cleaned inside would seem to show that some insects as ants had made an attack upon them and eaten them. What are the enemies of our common snails? I have often found perfectly clean dead shells under logs.—G. D. Lind, Lebanon, Ohio.

An interesting study of *Scissurella*, illustrated with figures of the living animal and dentition, by A. Vayssi re, of Marseilles, is pub-

lished in the current number of the *Journal de Conchyliologie*. The external features as well as the dentition differ very widely from *Pleurotomaria*, the teeth being as in *Trochidæ*.

In Abstr. Proc. Linn. Soc. N. S. Wales, meeting of Sept. 26, 1894, Mr. John Brazier retracts his former opinion that *Patella kermadecensis* is not from the Kermadec group, and quotes from a pamphlet published in 1887, stating that on Macauley Island there occur "large limpets (as big as small saucers and good eating)."

The last number of the *Journal de Conchyliologie* contains a portrait and biographical sketch of Dr. Paul Fischer.

PUBLICATIONS RECEIVED.

ON A MOLLUSCAN GENUS NEW TO, AND ANOTHER FORGOTTEN FROM AUSTRALIA, By Charles Hedley (Proc. Roy. Soc. Vict., 1894).—*Lucapinella* is identified from Australia with two species, *nigrita* Sowb. and *pritchardi* Hedley. *Scyllæa pelagica*, recorded by Cuvier from W. Australia years ago, has lately been collected at Port Philip by Mr. J. B. Wilson.

DESCRIPTION d'un Hélicéen nouveau provenant de la cote occidentale du Maroc, par Ph. Dautzenberg (Bull. Soc. Zool. de Fr. 1894, p. 17).—*Helix (Jacosta) Renati* is described and figured. We cannot distinguish it from *H. argonautula* Webb & Berth., a species referred by European authors to *Ochthephila* or *Discula*, but really belonging to *Jacosta*.

THE LAND AND FRESHWATER MOLL., NEW PHILADELPHIA, O., by Dr. V. Sterki.—A list freely annotated with Dr. Sterki's habitual critical acumen recording 151 species. The new forms described are *Pupa curvidens* var. *gracilis*, "intermediate in shape between the type and *P. holzingeri*;" *P. pentodon* f. *curta*; *Vertigo ventricosa* v. *elator*; *Planorbis exacutus* var. *rubellus*. *Gundlachia* is reported, and two *Pisidia* described in the preceding pages are noticed.

UEBER BINNEN-CONCHYL. der Küstenzone von Rio Grande do Sul, von Dr. H. von Ihering.—From the study of land snails found in Quaternary deposits the conclusion is reached that formerly the region in question was wooded, and more favorable to snail life than the present sandy expanse with sparing grass growth. In the living fauna a remarkable new genus of *Succinidae* occurs, like a *Hyalimax* with completely internal, spireless shell.

DIE SUSSWASSER-BIVALVEN JAPANS, von H. von Ihering (Abh. Senck. naturforsch. Gesellsch.).—In the discussion of the species, this work supplements Kobelt's Fauna Japonica, describing several new specific forms. In the Japanese bivalve fauna, v. Ihering finds only East Asiatic types, and those occupying the entire Holarctic tract (such as *Margaritana margaritifera*). There are no peculiar forms of more than specific value, the fauna being merely a part of that of the adjacent Siberian and Chinese countries, unspecialized except in the specific characters, and many of the species are very near those of the mainland. It is interesting to find that these results coincide with the facts known in regard to the freshwater gastropods and the land shells. Except that the mollusk fauna of Japan has a more southern aspect than that of the adjacent mainland (due to the warm ocean current, the "Gulf stream of Japan"), there is no difference of any importance in zoogeography.

PRELIMINARY LIST OF THE MOLLUSCA OF ARKANSAS, by F. A. Sampson (Ann. Rep. Geol. Surv. Ark., Vol. II).—81 species are the result of several years work by Mr. Sampson, not including *Unionidae*, which will be treated separately. The State has been little known to conchologists hitherto, and the present catalogue supplies data for the southwestern range of a considerable number of species. It is judiciously annotated, and illustrated with woodcuts of *Triodopsis edentata* Sampson.

A BIOLOGICAL EXAMINATION OF LAKE ST. CLAIR (Bull. Michigan Fish Commission, No. 4).—The present preliminary account details the methods adopted by the Michigan Fish Commission, with brief lists of the various forms of life, a map of the lake, etc. The mollusks were studied by Mr. Bryant Walker and listed on pp. 43, 44. More elaborate reports on the principal groups are in preparation.

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THE NAUTILUS

A MONTHLY
DEVOTED TO THE INTERESTS
OF CONCHOLOGISTS.

EDITOR :

H. A. PILSBRY, Conservator Conchological Section, Academy of Natural Sciences, Philadelphia.

ASSOCIATE EDITOR :

C. W. JOHNSON, Curator of the Wagner Free Institute of Science.

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No. 10.

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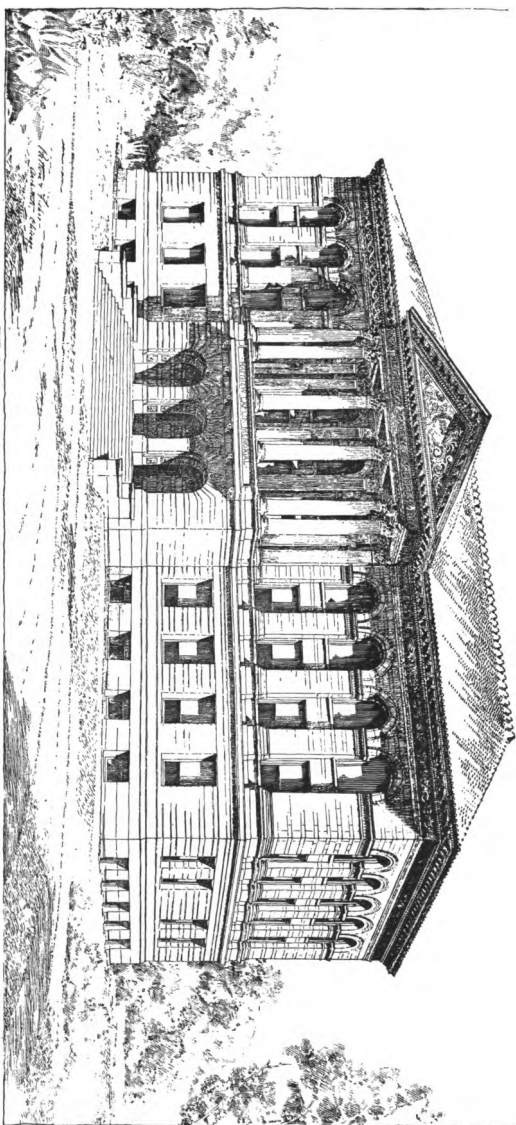
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MRS. E. C. WISWALL, Kenosha, Wis.

THE NAUTILUS, VIII.

PL. III.



THE CHICAGO ACADEMY OF SCIENCES, LINCOLN PARK

PATTON AND FISHER, ARCHITECTS.

FEB 1 1895

THE NAUTILUS.

VOL. VIII.

FEBRUARY, 1895.

No. 10

A GLANCE AT THE CHICAGO ACADEMY OF SCIENCES.

BY FRANK C. BAKER, SECRETARY.

In 1857, a society for the promotion of science, was formed in Chicago, taking the name of "The Chicago Academy of Natural Sciences." About \$1,500 was subscribed, a room taken in the Saloon Building, corner of Clark and Lake Streets, a few cases were made, and a museum was begun. In 1859, the society was incorporated by the name of "The Chicago Academy of Sciences."

In the winter of 1863-4, several prominent citizens of Chicago resolved to found a Scientific Museum in the Metropolis of the Northwest. A large sum of money was accordingly subscribed, an Act of Incorporation, (1865) as now published, was obtained and the Academy was placed upon a solid foundation. Mr. Robert Kennicott was appointed first Director of the Museum. Collections rapidly rolled in and rooms were taken at the Metropolitan Building, corner of Randolph and La Salle Streets. In 1865 Mr. Kennicott, with a party of young naturalists went to Alaska to survey a route for a telegraph line, then proposed to connect North America with Russia. From this expedition Mr. Kennicott never returned. He died suddenly of heart failure on the banks of the Yukon River. After the death of Mr. Kennicott, Dr. William Stimpson was appointed Director of the Museum.

June 7, 1866, the building in which the Museum was placed was partially destroyed by fire. The collections were much damaged,

and parts were wholly destroyed. This calamity brought the question of a permanent building to head, and a lot on Wabash Avenue, north of Van Buren Street was purchased and a fire-proof building erected. The first meeting was held January 28, 1868. The building was of brick 55 feet by 50 in area, and 50 feet high; the floors were of brick and iron the stairways and principal doors of iron, and the windows were covered with iron shutters. The basement was used for laboratory and storeroom; the first floor for library and offices, while the whole upper part, surrounded by two wide galleries, was occupied by Museum. From this time until the great fire the growth of the Academy, under the skillful management of Dr. Stimpson was rapid, and much valuable original work was done.

On the 9th of October, 1871, this building, in spite of the fire-proof qualities which it was supposed to possess, was totally destroyed in the great conflagration which laid Chicago in ashes,—specimens, library, manuscripts, and apparatus—all that was left of the once invaluable collections was a sheet of printed paper and a few pieces of broken pottery. Within twelve days after the fire, however, a meeting was held and steps taken towards a restoration of the Academy. A circular was issued inviting the sympathy and help of corresponding societies, which elicited many immediate and liberal responses. The loss of his priceless manuscripts so prostrated Dr. Stimpson that he died on the 26th of May, 1872.

It was soon determined to rebuild upon the old site, and upon the same plan modified by such improvements as experience could suggest. Upon the front of the same lot a business block of the first class, four stories in height was erected. The restored building was occupied in the fall of 1873. The funds at the disposal of the Academy being insufficient for their needs, they borrowed such additional sums as were necessary, securing the lender by a mortgage upon the whole property. They estimated that the income from the property would provide a sinking fund by which the original indebtedness would be paid when it became due. The scheme, however, proved disastrous. The new building did not pay the interest on the indebtedness, and after a term of years, in process of law, the whole property was lost to the Academy.

When, in 1886, the Academy was finally driven from its home on Wabash Avenue, the Exposition Company received the collections within its building upon the lake front and paid the expense of their

maintenance. But in its turn, the exposition company was ousted and its building destroyed. The property of the Academy was sent to storage where it remained for several years. In 1891 when the affairs of the Academy seemed to have reached their lowest ebb, a proposition was made to unite its fortunes with the University of Chicago, then just organizing. This the Academy was not willing to do, feeling that in time the identity of the organization would become lost in that of the University. In 1892 a generous citizen of Chicago Mr. Matthew Laflin, seconded and aided by his son George K. Laflin promised to give a sum adequate for the purpose of erecting a building which should stand for all time as the home of the Academy. In addition to this, it was ascertained that it was possible for the commissioners of Lincoln Park to aid in the prosecution of such an enterprise by offering a site and additional endowment. The result is one of the most perfect museum buildings situated in one of the most beautiful parks in the world. In June, 1893, the corner stone was laid and Nov. 1, 1894, the building was formally thrown open to the public.

The new building is a plain rectangular structure measuring 150 by 50 feet. The material of the building is Bedford stone and the architecture is Romanesque. Over the central doorway is the inscription MATTHEW LAFLIN MEMORIAL. The interior is decorated in old gold and ivory giving a soft tone to the light. There is electricity, running water, electric bells, elevator, and all the modern improvements which go to make up a perfect museum.

The library contains 5000 scientific works. It communicates with the museum by two stairways. The museum hall is 150x50x30 feet, with one wide gallery. Upon the main floor there are 24 large cases, in the gallery the same number with the addition of a large rail case. Unlike most museums *there is not a dark corner in the building*, from cellar to garret.

The collections consist for the most part, of North American productions, and are most complete so far as the valley of the Mississippi is concerned. In Mollusca, the collection is rich in North American forms.

With a new building and the best of facilities, it is believed that the Academy will again occupy a prominent place among Scientific bodies, and regain the prestige and fulfil the promise of its earlier days.

ON A NEW SPECIES OF HOLOSPIRA FROM TEXAS.

BY WM. H. DALL.

Holospira pasonis n. sp.

Shell white, mostly smooth but hardly glossy, of eleven and a half whorls; two and a half smooth, inflated, nepionic whorls, the apex flattish, followed by several whorls which are minutely ribbed in harmony with the incremental lines, the ribbing gradually becoming obsolete over most of the shell but reappearing on the last whorl, especially the basal part, sharper and somewhat crowded just behind the reflected lip; umbilicus closed or reduced to a minute chink; suture distinct, sutural edge continuing as a keel to the reflected margin of the aperture; aperture very short necked, almost circular broadly reflected; the pillar, as usual in the genus, tubular above the last whorl, the axis externally simple but somewhat flexuous. Lon. 22.5, max. diam. 6.5 mm. El Paso County, Texas, from Mule cañon at an elevation of 4000 feet. This species is nearest to *H. coahuilensis* W. G. Binney, which has one or two more whorls, the last two proportionately more attenuated with more extended, sharper and more distant sculpture, and obtusely keeled or compressed base resulting in a much more triangular and narrower aperture. It is not particularly close to any of the other species hitherto described, the *H. semistriata* Stearns being quite distinct. A marked character is the evenly rounded basal part of the whorl just behind the lip.

The specimens were procured by a correspondent of Mr. J. A. Singley.

MEGATEBENNUS BIMACULATUS.

BY MRS. M. F. BRADSHAW.

One day last September I found a curious and interesting mollusk. On a ledge of rocks, so high as only to be reached by the waves at the highest tides, there was a hollow containing a barrel or more of water.

Poking around in this I saw what appeared to be a bit of flesh. I took it out, thinking I had found a small *Lucapina crenulata*,

whose shell is—or appears to be—internal. But this one wore his shell upon his back for what purpose I do not know, for it was too small for protection, and the creature himself was so unpleasant to look at, no beauty of shell could redeem his ugliness.

Red-brown in color, warty, even the inadequate shell was a dull greenish-grey; not a single pretty feature!

Only an enthusiast could have taken him up with a thrill of pleasure, instead of a qualm of disgust.

Upon examination at home, it was determined to be *Fissurellidæa bimaculata*; yet the shell does not quite tally with the description in West Coast Shells. Internally it is white, outside gray-green with fine sculpturing; the rays running from the aperture to the edge are strong, the circular ribs faint, and the margin is not crenulated. *F. bimaculata* is said to be $\frac{1}{4}$ in. in length; this one is more than double that size. And the dark spots on the sides are not visible. If the green stain could be removed perhaps they would appear; but as the size is too great for *bimaculata*, perhaps I have a *Fissurella* not credited to this coast.

ON COLLECTING PISIDIA.

BY DR. V. STERKI.

Pisidia, and for a good part Sphaeria, are by far not sufficiently known, systematically as well as geographically. Requested to do so, and encouraged by prominent conchologists, the writer is going to work them up. Already some valuable materials are at hand; thus the entire Pisidium-collection of Mr. E. W. Roper, numerous lots, most from Lake Michigan, sent by Mr. Bryant Walker, others from Mr. H. Prime and other conchologists, besides my own collection; and some good results have so far been attained. Yet these materials are absolutely insufficient for a thorough study and knowledge of these small mussels which, with all their minute size, are a very conspicuous and interesting part of our molluscan fauna. They should be studied in their different forms, considerably variable according to their habitats, and all kinds of waters should be searched for them all over the continent.

Whoever has collected Corbiculidæ assiduously will know that they are, as a rule, present in large numbers, wherever found. The

best means for collecting them is a rather long (8-12 inches) net of strong canvas, such as used for embroidery work, fastened to a ring of strong wire¹, five to eight inches diameter, with a handle, to be used either directly, or fastened to a stick, or pole up to ten or twelve feet long. For deep waters a dredge should be used. The "stuff" gathered is shaken and washed until the remains are free of fine mud, then in a basket, sack, or some other suitable receptacle brought home, where the mollusks, Corbiculidae and others, may be picked out at leisure. If they are not to be kept alive, it is best to spread the materials on large pieces of paper, or cloth (bed sheet e. g.) and let them become dry. In this way, especially if one or several fine sieves are used, they are most easily found; and none of them should be overlooked, as some forms are very minute, and the young of all are of interest, while fully grown specimens are comparatively scarce, and so are certain species in some places. If sent for examination, all from a locality are best left mixed up, and not separated, but with notes on the nature of their habitat.

Hundreds, and thousands of specimens may be secured in a short time, not to speak of other mollusks, among which, last not least, very young Unionidæ. The best places are, as a rule, among aquatic plants, and also in deep places, or holes, where the mussels are washed together. But it must also be said, that they are found most actively propagating in late fall and early winter.

New Philadelphia, Ohio, Jan., 1895.

NOTE. In Dr. Sterki's article in the January NAUTILUS, the word *nacre* should be read instead of "uave" on page 97, 9th line from foot of page, and also on page 99, 16th line from top.

Pisidium punctatum has also been found in Lake Michigan and in Herkimer Co., N. Y.

NEW AMERICAN FRESH-WATER MOLLUSKS.

BY H. A. PILSBRY.

Planorbis alabamensis n. sp.

Shell small, whitish corneous, solid, lens-shaped; intermediate in form between *P. exacutus* and *P. dilatatus*. Upper surface convex,

¹ Where fastened to the wire, the net should be enveloped with strong cloth, or leather, lest it will wear off; and the seams should be securely sewed.

but the apex is slightly sunken; whorls nearly three, slightly convex, rapidly widening, acutely keeled at the periphery, the keel projecting above the suture on the penultimate whorl in most adult specimens. On the last whorl the keel is about median in position, is acute, as if pinched out, and extends to the aperture. Base of shell convex, rising toward the umbilicus, which is moderately large and funnel-shaped, with very obtusely angled margin. Aperture small, oblique, sub-rhombic; the lip strongly thickened within. Alt. 1.8, diam. 3.4 mm.; width of aperture 1.6 mm.

Woodville, Alabama (Prof. H. E. Sargent). This is a smaller species than *P. exacutus*, with much smaller less oblique aperture, thick lip, and not so flattened. It differs from *P. dilatatus* in the acute peripheral keel, etc.

***Amnicola olivacea* n. sp.**

Shell olive-colored, somewhat intermediate in form between an ordinary *Amnicola* and *Pomatiopsis lapidaria*. Spire elevated, the apex rather acute. Whorls 5, very convex. Aperture ovate, less than half the length of the shell, angular above; peristome free except for a very short distance on the parietal wall; umbilicus rather large. Surface smooth; coated with iron oxide in the adult specimens seen.

Alt. 4.2, diam. 2.5 mm. (Male?).

Alt. 4.2, diam. 3 mm. (Female?).

Huntsville, Ala. (coll. by Prof. H. E. Sargent; see NAUTILUS for December, 1894, p. 95).

This form is quite distinct from other *Amnicola*, being of more elongated contour than any other Northern forms except *A. lustrica*. Its nearest allies are some of the smaller slender Floridian forms, but none of these have such convex whorls. As I have seen dry specimens only, I have not verified the reference of the stouter individuals to the female sex, but from analogy with other species this is probable. The supposed males have much the general appearance of *Pomatiopsis cincinnatiensis*.

***Planorbis bicarinatus* arcostookensis n. var.**

Shell having the spire and umbilicus very deep, the latter funnel-shaped as in typical *bicarinatus*, but both upper and lower keels entirely obsolete or rounded off on last whorl, which has the aspect of that of *P. trivolvis*. Surface minutely striated spirally as in *P. bicarinatus*. Aperture less angular and less produced below than in *bicarinatus*, in consequence of the rounding of the whorls. Diam.

15, alt. at aperture $7\frac{1}{2}$ mm. Specimens from East branch of Salmon brook, Woodland, Aroostook Co., Me., coll. by O. A. Nylander, Caribou, Maine.

Vivipara georgiana limnothauma n. var.

Whorls much swollen around the upper part, sloping below, giving a shouldered appearance. This is one of the most remarkable forms of *Vivipara* yet made known. Types are from an aboriginal shell-field on Hitchen's Creek, but it also occurs living in Lake George, 2 fms., off Drayton's Island (Pilsbry and Johnson coll.).

MOLLUSKS OF ALLEGHENY CO., PENNSYLVANIA.

BY GEO. H. CLAPP, PITTSBURGH, PA.

Below is given a list of additional species of land and fresh-water shells collected in Allegheny Co., Pa., to be added to the list published by Mr. S. H. Stupakoff in the NAUTILUS, April, 1894.

<i>Hyalina cellarius</i> Müll.	<i>Unio crassidens</i> Lam.
<i>Hyalina nitidus</i> Müll.	<i>Unio luteolus</i> Lam.
<i>Mesodon mitchelliana</i> Lea.	<i>Unio gracilis</i> Lam.
<i>Pupa curvidens</i> Gld.	<i>Unio rubiginosus</i> Lea.
<i>Succinea aurea</i> Lea.	<i>Unio orbiculatus</i> Hild.
<i>Succinea obliqua</i> Say.	<i>Unio securis</i> Lea.
<i>Limnæa parva</i> Lea.	<i>Unio cornutus</i> Bar.
<i>Gyraulus dilatatus</i> Gld.	<i>Unio undulatus</i> Bar. (?) dead
<i>Pleurocera canaliculatum</i> Say.	[broken shell.]
<i>Goniobasis</i> ? (Young).	<i>Unio obliquus</i> Lam.
<i>Unio ovatus</i> Say.	<i>Ancylus tardus</i> Say.
<i>Unio rectus</i> Lam.	<i>Ancylus rivularis</i> Say.
<i>Unio pilaris</i> Lea.	

From the previous list, *Mesomphix lævigatus* Pfr. should be dropped. I have found *Mesodon sayii* Binn. in Beaver Co., but have not, so far, found it in this county.

NOTE ON UNIO OREGONENSES LEA.

For years I have been puzzled over a shell in the Lea collection of Naiads which Lea received from Wheatley as coming from the

Columbia river, Oregon and which the former named *U. oregonensis*, describing and figuring it in Trans. Am. Phil. Soc. X, p. 275, pl. 22, fig. 33. The specimen is in bad condition, being somewhat broken and considerably eroded. In a paper on the Relationships and Distribution of the North American *Unionidae*, with notes on the West Coast Species, which I published in American Naturalist, Vol. XXVII, No. 316, I stated that I had come to the conclusion that the specimen in question was a form of the widespread and variable *Unio luteolus* Lam, there being examples in the National Museum from Canada very much like it. I believed that if it really came from the Columbia river it was just possible the young might have been carried in mud on the feet of aquatic birds, from waters near by which drain into the Missouri, in which stream *U. luteolus* is found. But I have never been quite satisfied with my determination of the shell, since it always seemed to resemble to some extent a group of the Mexican species. To-day, in carefully going over all the Mexican and Central American Naiad material in our own and the Lea collections I suddenly discovered a surprising resemblance between the Lea specimen and some others of *U. rowelli* Lea, and on careful comparison I found it to be undoubtedly an old, solid, and inflated female of that species.

Unio rowelli is a remarkably variable form which I cannot for a moment doubt is exactly synonymous with *U. macneilii* Lea, the types of both species being in the Lea collection. Lea calls attention in his description to its resemblance to *U. sapotalensis*, to which it is closely related, and it may be remarked in passing that in this group the females and males are separate, the former being inflated in the posterior ventral region like those in the *Luteolus* Group. Some specimens of this protean species are much inflated, others are compressed; some are somewhat triangular and pointed at the base of the posterior slope, without a trace of biangulation, others are nearly rhomboid and distinctly biangulate; there is considerable variation in the degree of sulcation, and in the coloring of the epidermis. They may be either uniform greenish-yellow, brownish, or marked with distinct and delicate radiating stripes as in the type of *U. oregonensis*. And all these variations may occur in a lot from a single locality.

The cardinals are rather compressed, double in the left and single in the right valve, and have a peculiarly rough, torn appearance; while the laterals are somewhat striated longitudinally.

As *Unio oregonensis* was described probably about the year 1852, *rowelli* in 1859, and *Macneilii* in 1874, the former should have precedence. But it may be set down as an absolute certainty that no member of the group to which this species belongs was ever found nearer than 1500 miles from the Columbia river, and the locality is undoubtedly an error. As the name *oregonensis* is, therefore, misleading, I think we are justified in applying to the species the next oldest name, *Unio rowelli* of Lea. As I have shown in the article referred to in American Naturalist that *Unio famelicus* Gld. of the Columbia region is only a young *Unio multistriatus* Lea, of Brazil, I think I am safe in saying that no Unios are known to inhabit North America west of the great Rocky Mountain chain; this being the largest area destitute of *Unio* life in the temperate or tropical regions of the globe.

C. T. Simpson

NOTES AND NEWS.

MR. A. A. HINKLEY has removed from Du Bois, Ill., to Rockford, Illinois, which will be his address in future.

MR. EDW. W. ROPER and Mrs. Roper sailed for Jamaica on Dec. 19, to spend the winter collecting shells and ferns.

A TRAIN STOPPED BY SNAILS.—Mr. Laille, an engineer in the employ of the Tunisian Railway, writes in the *Dipeche Tunisienne*: "The train coming east from Suk-el-Arba last-Thursday was two hours late for a very singular reason. The road was literally covered with snails, the wheels of the locomotive crushing these mollusks into a pulp, which destroyed all adherence and caused the locomotive wheels to skate, so to speak, in their places. We have seen flocks of locusts stop trains, but I think the fact that snails can stop a train is without a precedent. These snails are very general all through Tunis, especially during the rainy season; the smallest remainders of green on field or tree are covered with them, so much so that they appear like a bunch of grapes hung up, only that their white shells produce a curious effect."—*Phila. Record*.

MR. JOHN B. HENDERSON of Washington, D. C., has sailed for Japan, with Mr. John W. Foster, to be absent about three months.

HELCLIONISCUS NIGRISQUAMATUS.—By error, the word "not" was printed for *now*, in line 11 from bottom of Mr. Taylor's article on this species, October number, p. 66. As it completely changes the meaning of the sentence, this correction should be made.

FULGUR PERVERSUM is a rare shell on the coast north of Delaware Bay, if, indeed, it occurs at all living. Mr. Curtis Smith has recently found dead and blackened (fossil?) specimens at Wildwood, N. J.

PROF. H. E. SARGENT of Woodville, Ala., called upon his friends in Philadelphia on the 26-28th inst. He purposes to be in New England for the next month or more.

NEW PUBLICATIONS.

THE LIFE AND WRITINGS OF RAFINESQUE, By Richard Ellsworth Call.¹ (Filson Club Publications, No. 10).—To most naturalists, a peculiar charm attaches to the personalities of their predecessors in the same field of endeavor. And we of to-day, who may fairly be reckoned as the third generation of nature students in America, have a natural curiosity to know something of the men of that first generation, to whom the "New World" was indeed new—who enjoyed in such generous measure that intense delight which can only be felt or appreciated by the field naturalist in the presence of forms of life new to him. Rafinesque, the subject of Mr. Call's present work, has been much less familiarly known to us than any of the other pioneers in American zoology; he was misunderstood by most when living, and scoffed at dead. It is, therefore, with unusual interest that we follow the tale of his eventful life as it is here related. Mr. Call, after telling of his early training, or rather lack of training, follows his hero to France and then to Sicily, where Rafinesque's life work was begun, and his peculiar characteristics as a naturalist were developed. When he finally left that sunny island for America, he was already the author of many works and papers on numerous branches of zoology and botany, though only thirty-two years of age. His career of misfortune in America—relieved only by the intense pleasure of his work—is graphically described, the period covered by his life in Kentucky being given most space, this time covering Rafinesque's most important contributions to American science. Two portraits of Rafinesque are reproduced, as well as an autograph letter and sample pages of some of his works, all by good photo process engravings. The volume concludes with a bibliography, which seems to be complete.

The character of Rafinesque is appreciatively interpreted by Mr. Call, and his shortcomings are as leniently mentioned as strict re-

¹ Louisville, Kentucky, 1895, 4to. pp. xii, 227.

gard for right will admit. Acknowledging frankly the great defects of the eccentric naturalist's work, its value and genius are still considered by Call to be very considerable. There can be no doubt that in the appreciation of *natural groups*, Rafinesque had great insight, as his biographer claims; but still we can hardly endorse the statement: "considered as a whole, the conchologic work of Rafinesque was remarkably well done." From some acquaintance with that work, we would rather call it remarkably *badly* done, and only saved from worthlessness by certain glimmers of genius, in the ability to grasp natural groups. Some facts of value could have been obtained had Mr. Call corresponded more freely with Philadelphians, as here Rafinesque spent many years. Among other things, the statement in regard to the Poulson collection of Rafinesque's *Unionidæ* on p. 109, would not have been made. This collection was collected and labelled by Rafinesque, was procured by Tryon from Poulson's estate and is now preserved in the collection of the Academy of Natural Sciences of Philadelphia.

As a whole the volume seems remarkably free from mistakes of any kind, considering the difficulty of the subject. The typography is superb. The proof-reading is almost perfect, though we note a very few slips, such as "profligate" for prodigal, on p. 75. It is printed on fine paper, with wide margins, and is altogether a beautiful piece of book-making. We trust it will find a place on the shelves of conchologists and naturalists generally, and lead to a more just appreciation of this great though erratic genius.

THE MECHANICAL CAUSE OF FOLDS IN THE APERTURE OF THE SHELL OF GASTROPODA, By Wm. H. Dall (Amer. Nat., Nov., 1894).—The plicæ and folds found in the aperture and throat of gastropod shells are explained by the wrinkling of the mantle when retracted into the gradually narrowing caliber of the shell, and pressed between the solid foot and the shell wall. The semi-fluid secretion of which the shell-lining is built up is exuded from the whole surface of the mantle, but becomes rubbed off where the summits of mantle-folds press against the shell, gradually accumulating in the interstices between these folds. It is found that in shells having the ridges extending far inward, the adductor muscle is attached far within; in those having no folds, or only at the margin of the aperture, the adductor is attached to columella lower down. The deeper this attachment, the greater the distance over which the mantle is drawn, and consequently the greater its folding by compression, and the more emphatic the shell-ridges deposited by it.

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THE NAUTILUS

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DEVOTED TO THE INTERESTS
OF CONCHOLOGISTS.

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H. A. PILSBRY, Conservator Conchological Section, Academy of Natural Sciences, Philadelphia.

ASSOCIATE EDITOR :

C. W. JOHNSON, Curator of the Wagner Free Institute of Science.

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No. 11.

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APR 5 1895

THE NAUTILUS.

VOL. VIII.

APRIL, 1895.

No. 12

MOLLUSK FAUNA OF PHILADELPHIA AND ENVIRONS.

BY MORRIS SCHICK.

In the Proceedings of the Academy of Natural Sciences of Philadelphia for 1861, page 306, Mr. W. M. Gabb has given a list of Philadelphia mollusks, enumerating 62 species, seven of which are, however, synonyms or doubtful inhabitants of this region. Having collected a number of species in this vicinity which are not on Gabb's list, the writer thought it well to make a new one, giving exact localities where the various species have been found during the last two or three years in the neighborhood of Philadelphia, and including not only those forms personally collected, but also the species and localities discovered by other local naturalists—Messrs. Walton, Vanatta, Stone, Pilsbry, McGinty, Johnson, Ford, Fox and Eisenhardt, all of whom have contributed materially to the list.

The importance of the Philadelphia fauna, as being the type locality of many of Thomas Say's species, will always render it of interest to those who study geographic variation; and moreover, an accurate local list is of value to conchologists in the future, in determining the ever fluctuating geographic limits of species and varieties. While many of the special localities herein recorded will be destroyed by the growth of the city, others situated in Fairmount Park, especially along the Wissahickon, will doubtless perpetuate within the city limits most of the species indefinitely; and the aquatic forms will survive at least as long as the Schuylkill furnishes the water supply of the city.

The west bank of the Schuylkill above Girard Avenue was a very good collecting ground, where one could find in good numbers *Polygyra hirsuta*, *P. thyroides*, *P. tridentata juxtidens*, *Pyramidula alternata*, *Gastrodonta ligera*, *G. suppressa*, *G. nitida*, *Vitræa arborea*, and *Selenites concava*, with a few others not so common; but this place has been destroyed this year by the laying out of a drive. On the land shells of the park, see Ford, *Conchologists' Exchange*, II, p. 7.

In his list Mr. Gabb refers to *Helix labyrinthica* as common near Germantown; I have been able to find but three specimens of this species, after a diligent search of three seasons. He also mentions *H. hirsuta* as one of our commonest species, but this is now also uncommon; while others are becoming rare, there are some species now quite common that are not mentioned in Mr. Gabb's list, such as *Limax maximus*, *Pyramidula striatella*, *Vallonia costata*, *Pupa contracta*, *Succinea obliqua*, *Sphærium striatinum*, *S. transversum*, etc. *Helix egena* Say, a depressed form of *Conulus fulvus*, was described from ten miles above Philadelphia; and *C. chersina*=*fulvus* is reported in Gabb's list as found near Germantown by Tryon. It has not occurred to recent collectors.

Helix appressa, admitted by Gabb, on the evidence of one specimen found on E. K. Tryon's estate near Germantown, was evidently a lost cabinet specimen. *Amnicola lustrica* Say of Gabb's list is the half grown *Pomatiopsis lapidaria*. "*Margaritana rugosa* Say," is an evident pen error for *M. marginata* Say, which Gabb omits. *Unio fisherianus* reported from the Schuylkill above Girard Avenue bridge, one specimen, may have been an incorrect identification.

TESTACELLIDÆ.

[*Testacella maugei* Fér. Green house on School Lane, Germantown.]

SELENITIDÆ.

Selenites concava Say. Both banks of Schuylkill at Falls, and below; everywhere rare.

LIMACIDÆ.

[*Limax maximus* L. West Philadelphia and Darby, plentiful in cellars and green houses (Pilsbry); Wissahickon, uncommon; Laurel Hill Cemetery, common; Germantown (Vanatta)].

NOTE.—Introduced species are enclosed in brackets The authority cited for each special locality refers to that immediately preceding only, but many of the places have been visited by several collectors.

[*Limax agrestis* Müll. Abundant in and around the city, and varying much in coloration.]

Limax campestris Binn. Common in most suitable localities around the city.

ZONITIDÆ.

Gastrodonta suppressa Say. Belmont glen, common (H. E. Eisenhardt); Tulpohocken Valley, Germantown, uncommon; Perkiomen; Glenside (Johnson); Fisher's Station, Germantown (Stone).

"I found a few specimens of this shell on the farm of my friend Mr. Reuben Haines at Germantown." (Say.)

Gastrodonta ligera Say. Wissahickon, common; also near Strawberry Mansion and West Falls of Schuylkill.

Gastrodonta ligera Stonei Pils. Westville, N. J., common; Hollyoak, Delaware (Stone, TYPE locality).

Gastrodonta (Zonitoides) nitida Müll. Wissahickon; West Park; and Westville, N. J., common. In Nov., 1893, they were found near Strawberry Mansion, East Park, congregated in immense numbers under logs (Vanatta).

Gastrodonta (Pseudohyalina) minuscula Binn. Wissahickon, rare; West Falls of Schuylkill (Vanatta); Westville, N. J. (Fox).

[*Vitræa (Polita) cellaria* Müll. Wissahickon, uncommon; Conshohocken (R. Walton); found also in cellars of dwellings.] This is the *Helix glaphyra* Say, described in Nicholson's Encycl., Amer. Ed., 1818. "Taken by Mr. G. Ord in his garden in Philadelphia." (Say.)

Vitræa arborea Say. Same locality as *G. nitida*; Fisher's Station, Germantown, common (Stone); Westville, N. J. (Fox).

Vitræa indentata Say. Wissahickon, uncommon; Westville, N. J., common; Fisher's Station, Germantown (Stone).

Vitræa radiatula Alder (*viridula* Mke.; *electrina* Gld.). Lansdowne Valley, a few specimens; Wissahickon, rare; near Falls of Schuylkill (E. G. Vanatta); Westville, N. J. (Fox).

ENDODONTIDÆ.

Punctum pygmaeum minutissimum Lea. Gloucester Co., N. J. (Wm. J. Fox, NAUTILUS, IV, 113).

Pyramidula alternata Say. Wissahickon and Germantown, common; near Falls of Schuylkill (Vanatta); West Park (Ford); Perkiomen (Johnson); a pallid, spotless variety is found along the Wissahickon.

Pyramidula striatella Anth. West Park, common; Wissahickon, common; Westville, N. J., one specimen; near Strawberry Mansion, where, in Nov., 1893, they were found congregated in immense numbers (Vanatta).

Pyramidula (Helicodiscus) lineata Say. Lansdowne Valley, uncommon; Wissahickon, a few specimens; near Strawberry Mansion (E. G. Vanatta); Germantown (R. Walton; Stone); near 58th St. Station, P. W. & B. R. R. (Pilsbry); "Found by Robert E. Griffith, near Philadelphia." (Say.); Westville, N. J. (Fox).

HELICIDÆ.

Polygyra (Triodopsis) thyroides Say. West Park, common; Wissahickon, common; Westville, N. J., common; Monument Cemetery (E. G. Vanatta); Fisher's Station, Germantown, and Fern Rock (Stone).

Polygyra (Triodopsis) albolabris Say. Wissahickon; Laurel Hill Cemetery; Perkiomen (Johnson); Fern Rock, rare (Stone); Westville, N. J. (Fox).

Polygyra (Triodopsis) tridentata Say. Wissahickon, moderately common.

Polygyra (Triodopsis) tridentata juxtidens Pils. West Park, and Laurel Hill Cemetery, common.

Polygyra (Triodopsis) fallax Say [*H. introferens* Bld.]. Flat Rock Dam, rare (R. Walton); Monument Cemetery, rare (E. G. Vanatta); Atco, N. J. (Fox); "Presented to the Academy by Messrs. Hyde and Mason who found it in the vicinity of Philadelphia where it is not uncommon." (Say.)

Polygyra (Stenotrema) hirsuta Say. West Park, uncommon; near Strawberry Mansion (E. G. Vanatta); Perkiomen (Johnson).

Polygyra (Stenotrema) monodon Rack. Strawberry Mansion (Ford); Perkiomen (C. W. Johnson).

Vallonia pulchella excentrica Sterki. Ruins near School Lane, common; Falls of Schuylkill (E. G. Vanatta); Fisher's Station, Germantown, common (Stone).

Vallonia costata Müll. East bank of Schuylkill, at Flat Rock Dam, very common; Falls of Schuylkill (E. G. Vanatta).

PUPIDÆ.

Pupa armifera Say. Ruins near School Lane, common; Falls of Schuylkill (E. G. Vanatta).

Pupa contracta Say. Ruins near School Lane, common; east bank of Schuylkill, at Flat Rock Dam, uncommon; near Falls of Schuylkill (E. G. Vanatta); Fisher's Station, Germantown, common (Stone); Westville, N. J. (Fox).

Pupa pentodon Say. Near 58th St. Station, P. W. & B. R. R. Pilsbry); Falls of Schuylkill (E. G. Vanatta).

Pupa corticaria Say. On walnut trees, School Lane, Germantown, rare.

Pupa fallax Say. Tulpohocken Valley, Germantown (John Ford).

Vertigo ovata Say. Tulpohocken Valley, Germantown (John Ford); "Numerous specimens were discovered by Mr. Wm. Hyde, in the vicinity of this city." (Say.)

Strobilops labyrinthica Say. Tulpohocken Valley, Germantown, rare.

ACHATINIDÆ.

Ferussacia lubrica Müll. (*subcylindrica* Auct., not Linné). Ruins near School Lane, common; Falls of Schuylkill (Vanatta).

[*Opeas octona* Linné. Introduced in green houses; Horticultural Hall (Robt. Walton)].

SUCCINEIDÆ.

Succinea avara Say. Conshohocken, common (R. Walton); Westville, N. J., one specimen; Tabor (Stone).

Succinea ovalis Gould. Wissahickon, uncommon; Westville, common; near Strawberry Mansion (Vanatta).

Succinea obliqua Say. Wissahickon, very common; Westville, N. J., common. Typical locality.

PHILOMYCIDÆ.

Philomycus carolinensis Bosc. Wissahickon, common; West Park, uncommon; South of Darby; Glenolden, Delaware Co. (Vanatta); Fisher's Station, Germantown (Stone).

AURICULIDÆ.

Carychium exile H. C. Lea. Wissahickon, rare (type locality).

Carychium exiguum Say. Wissahickon; Westville, N. J. (Fox).

LIMNÆIDÆ.

Limnæa catascopium Say. Delaware and Schuylkill Rivers, and Canal at Manayunk, common.

Limnæa columella Say. Ruins near School Lane, common; lakes near Memorial Hall, common; Perkiomen Creek (Johnson);

Tabor (Stone); Ponds along the Darby Creek Branch of the Reading R. R.

Limnæa humilis Say. Common in most localities.

Limnæa desidiosa Say. Schuylkill River, common.

Planorbis bicarinatus Say. Delaware and Schuylkill Rivers; Canal at Manayunk, common.

Planorbis trivolvris Say. Same localities as *P. bicarinatus*.

Planorbis deflectus Say. Canal at Manayunk, moderately common; Kaighn's Point, N. J., two specimens.

Planorbis exacutus Say. Ditch, South Broad Street, uncommon.

Planorbis dilatatus Gld. Near School Lane, rare; Ponds, South Broad Street; Fisher's Station, Germantown (Stone).

Planorbis parvus Say. Ditch at Kaighn's Point, N. J., common; near Strawberry Mansion (Vanatta); Fisher's Station, Germantown (Stone); Westville, N. J. (Fox).

Segmentina armigera Say. Westville, N. J., common; ditch at Kaighn's Point, N. J., common; ponds at Point Breeze (H. A. Pilsbry).

ANCYLIDÆ.

Ancylus rivularis Say. Rancocas Creek, N. J., and Schuylkill R., near Columbia Avenue Bridge (E. G. Vanatta); Perkiomen Creek (Johnson); Westville, N. J. (Fox).

PHYSIDÆ.

Physa heterostropha Say. This is the most abundant species, being found in almost all streams, ditches and ponds of this vicinity.

Physa heterostropha ancillaria Say. Delaware and Schuylkill Rivers. The specimens found show all the stages between *heterostropha* and *ancillaria*; Westville, N. J. (Fox).

Aplexa hypnorum L. Glen Riddle, Del. Co.; ditch at Kaighn's Point, N. J., uncommon. This is probably the extreme southern limit of this species.

VALVATIDÆ.

Valvata tricarinata Say. Schuylkill River, uncommon; canal at Manayunk, common. (Typical locality.)

Valvata bicarinata Lea. Same locality as the preceding; Westville, N. J. (Fox).

AMNICOLIDÆ.

Amnicola limosa Say. Canal at Manayunk, common; Westville, N. J.; Delaware River, below Gloucester. Typical locality.

Amnicola limosa porata Say. Canal at Manayunk, uncommon; lakes near Memorial Hall, Fairmount Park, common; Perkiomen Creek (Johnson).

Amnicola granum Say. Ditch at Kaighn's Point, N. J., rare; Corinthian Basin (John Ford).

Gillia¹ altilis Lea. Common in Delaware and Schuylkill Rivers; also canal at Manayunk; Westville, N. J.

Pomatiopsis lapidaria Say. Delaware River near Westville, N. J., common; near Strawberry Mansion (Vanatta).

VIVIPARIDÆ.

Lioplax subcarinata Say. Schuylkill River and Canal at Manayunk, common; Delaware River, very abundant.

Campeloma decisum Say. Schuylkill River, and Canal at Manayunk, common; Delaware River, uncommon; Ponds near Point Breeze (Pilsbry).

PLEURO CERIDÆ.

Goniobasis virginica Gmel. Common in Delaware and Schuylkill Rivers; fine specimens at the mouth of Wissahickon Creek. Like many Goniobases, this species is dimorphic, the form with raised spirals (*multilineata* Say), occurring with the smooth specimens.

CYRENIDÆ.

Sphærium striatinum Lam. Delaware and Schuylkill Rivers; canal at Manayunk, common.

Sphærium sulcatum Lam. Cobb's Creek (John Ford).

Sphærium fabale Prime. Canal at Manayunk, uncommon.

Sphærium partumeium Say. Greenwich Point, S. Philadelphia (McGinty).

Sphærium transversum Say. Mouth of Wissahickon Creek; Dam in Tulphocken Valley, Germantown, abundant; stream flowing from Lily pond near Memorial Hall (Vanatta); Westville, N. J. (Fox).

Pisidium virginicum Gmel. Delaware River; canal at Manayunk, uncommon; Rancocas Creek, N. J. (Vanatta).

Pisidium abditum Hald. Rock Run, uncommon; ditch at Kaighn's Point, N. J.; stream flowing from Lily pond near Memorial Hall (V.).

¹ *Gillia* in Mollusca has several months priority over the same name in Pisces.

In 1873 a second Mexican species was announced, *V. mexicana* Pfeffer, in Strebel's work on the fauna of Mexico, p. 130. It was 47 mm. long, red-brown to grey-brown and black-brown.

For many years no more additions were made; until in 1885 (or Jan. 1886?) Dr. Semper's elaborate work on the genus appeared. In this, on p. 293, we find *V. mexicanus* n. sp., from Mexico; but the author having discovered, too late to change the text, that there was already a species of that name, takes the opportunity of writing *V. strebelii* instead on the explanation to the plate. This *mexicanus* = *strebelii* is 51 mm. long, 15½ broad, with the female orifice 1½ mm. from sole and almost exactly equidistant from each end. On p. 316 of the same work, Semper describes a true *mexicanus* Pfeff., which he had from Strebel. It was found in Vera Cruz, and was whitish-flesh, only 20 mm. long, with the ♀ orifice a little hind of the middle. If this specimen was really of the same species as originally described in 1873, it must have been somewhat immature.

In the same work of Semper, p. 295, appears a Chilian species, *V. decipiens* Semper. This is supposed to be also a native of Mexico, but I think the latter habitat must be accepted with some reservation; unless perchance, it has reached there accidentally through human agency. It is dark yellowish-brown, with the mantle black-spotted, 42 mm. long, 16½ broad, ♀ orifice 1 mm. from sole, and somewhat anterior to the middle. This *V. decipiens* is very much like the Chilian *V. adspersa* Heynemann; so much so that one strongly suspects that they are forms of one species. They were published nearly at the same time, but I think *adspersa* has priority. Since Semper's work no further additions have been made.

In the British Museum are two other forms, which are the more interesting in that they represent new localities. They do not seem to be precisely identical with any of the described species, but all things considered, it seems preferable to leave them unnamed for the present. Descriptive notes are appended:

(1.) *Veronicella* sp. nov., vel *mexicana* var.

Long. (in alch.) 42½, lat. 20½, sole lat. 10 mm. ♀ orifice from head 22 (almost median), from sole 2 mm. Sole rather rounded posteriorly, not projecting beyond mantle, finely and closely transversely striate. Mantle above rugose-granulose, not at all papillate; color pale grayish-ochreous, above obscurely gray mottled, with the slightest indication of a dorsal and lateral dark band, only noticeable when looked for. Back arched, rounded. Upper tentacles grayish, lower pale ochery.

Honduras. Collector unknown. Heynemann had seen it when he visited the museum, and had written "nov. sp.?"

(2.) *Veronicella* sp. nov., vel *punctatissima* subsp.

Long. (in alch.) $41\frac{1}{2}$, lat. 12, sole lat. 4 mm. ♀ orifice from head 21 (almost median), from sole $2\frac{1}{2}$ mm. Sole very narrow, rounded behind, not projecting posteriorly, regularly and strongly transversely striate its edge longitudinally grooved. Mantle above thickly but rather irregularly impressed punctate, not papillate. Superior tentacles gray, lower pale ochrey.

Jaw brown, not very dark, with 36 very strong ribs. Penis tapering. Color variable, as follows:

- (a) Pale ochreous, above brown from thick brown mottling, with a slightly indicated but quite observable pale dorsal line. *Below with sparse black mottling.* Six examples.
- (b) Similar, but with more or less black spotting also above, though sparse. Four examples.
- (c) Similar, but dark brown above, no pale dorsal line.

Panama, Volcan de Chiriqui. Collector unknown.

The interesting point may here be noted, that whereas the Nicaraguan *olivacea* and the Honduras species are typically Central American forms, and show a good deal of resemblance to the species of the greater Antilles, the Panama species is quite different, and belongs with the series of the lesser Antilles, Trinidad, etc.

NOTES AND NEWS.

UNIO CARIOSUS and OCHRACEUS.—By an unfortunate oversight, the wood-cuts of these two species in the March number were transposed. The figure on page 121 is *U. cariosus*; that on page 122 is *U. ochraceus*.

BYTHINIA TENTACULATA.—A new locality for this species is Black Lake, Holland, Michigan, Mr. L. H. Streng having collected adult and young in all stages of growth there.

MR. H. E. SARGENT, having spent some weeks in New England, has returned to his home at Woodville, Ala.

MR. JAMES M. DE LANEY has removed from Rochester to South Livonia, Livingston Co., N. Y.

NEW PUBLICATIONS.

DISTRIBUTION OF THE LAND AND FRESH-WATER MOLLUSKS OF THE WEST INDIAN REGION, and their Evidence with Regard to Past Changes of Land and Sea. By Charles Torrey Simpson (Proc. U. S. Nat. Mus., XVII, 1894).—After a statement of the geographic facts in regard to the region, and the depths of sea between and around the main islands, Mr. Simpson considers the means of distribution of the land and fresh-water mollusks from island to island, concluding that while some forms have been transported by drifting trees, etc., the main means of transport has been by means of former direct land connection of islands now separated. "There appears to be good evidence of a general elevation of the Greater Antillean region, probably some time during the Eocene, after most of the important groups of snails had come into existence, at which times the larger islands were united, and there was land connection with Central America by way of Jamaica. * * * At some time during this elevation, there was probably a landway from Cuba across the Bahama plateau to Florida, over which certain groups of Antillean land mollusks crossed. * * * There followed a period of general subsidence. During this the island of * * Jamaica was first isolated, then Cuba, and afterwards Haiti and Puerto Rico were separated. The subsidence continuing until only the summits of the mountains of the four Greater Antilles remained above water; then followed another period of elevation which has lasted until the present time. * * The Bahamas have appeared above the surface of the sea, either by elevation or growth, and have been peopled by forms drifted from Cuba and Haiti. The lesser Antilles have been peopled, for the most part, from S. America." These conclusions are based upon tables showing the distribution of species and genera on the various islands, and the later movements are supported by well-known geological facts. The evidence for the earlier elevation should be compared with Spencer's "Reconstruction of the Antillean Continent" (Bull. Geol. Soc. Amer., VI, Jan., 1895), founded upon a study of the supposed sunken river-valleys, and altogether supporting Mr. Simpson's conclusions. That the West Indian region actually stood *two miles* above its present level, as claimed by Spencer, is a proposition requiring much more proof than has been offered, to bring it out of the realm of mere suggestion or hypothesis; and we are certainly not prepared to endorse it; but the orogenic movements required to fulfill the conditions asked by Mr. Simpson are far more moderate, and, it seems to us, by all odds the most reasonable explanation of the facts of distribution. Mr. Simpson's paper concludes with the descriptions of *Sagda maxima*, *Neocyclotus bakeri*, *Lucidella costata* and *Pleurodonte bowdeniana* n. spp., from Jamaica, the latter three from the Miocene beds at Bowden.

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